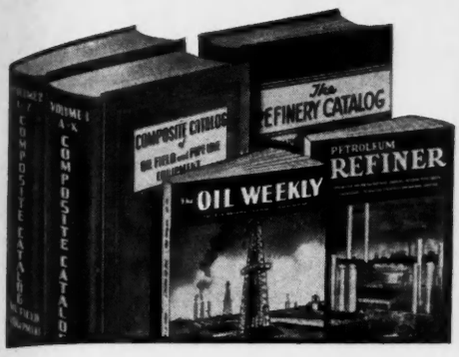

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for the drilling-producing-pipe line industry

PETROLEUM REFINER and The REFINERY CATALOG
for the refining-natural gasoline industry

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The OIL WEEKLY

ENGINEERING NEWS STATISTICS

R. L. DUDLEY, President, Publisher A. L. BURNS, General Manager

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Demand Trend Continues Upward

MUCH of the past experience in forecasting demand for petroleum products has been on the low side in spite of careful studies and reasonable assumptions. This was pointed out last week by Sidney A. Swensrud, executive vice president of Standard Oil Company (Ohio), before the Western Petroleum Refiners Association at San Antonio. A well-qualified industry committee in 1925 forecast that by 1945 total crude oil runs to stills would be 3.8 million barrels daily, and a similar authoritative study in 1935 forecast 3 million daily, whereas runs to stills in 1945 actually were above 4.7 million barrels daily.

The forecasters in both cases foresaw more motor vehicles but understandably failed to foresee that motor vehicles would cover much more mileage per year as roads were improved and that they would utilize better engine efficiency mainly for achieving better performance and comfort rather than for cutting down on weight of cars or increasing mileage per gallon. Consequently, gasoline use has far exceeded those earlier forecasts. As against 780 million barrels actually used in 1946, the 1935 study expected 600 million barrels of demand in 1945, and the 1925 study estimated 216 million to 432 million barrels, depending on price and adequacy of supply.

The early forecasters also understandably left out a consideration which has entered the picture and proved important, stated Swensrud. They based their estimates on gasoline as the primary and ruling product from crude oil. Actually, heating oil, tractor fuel, and other products have assumed great importance and have much weight in determining the volumes of crude run to stills. So strong has been the demand for these other products that in order to fulfill it, the industry has deliberately processed enough crude to obtain those products even though in doing so, gasoline yields had to be held down to avoid surplus production of that main product.

While much petroleum was used during the war, asserted Swensrud, the use was not abnormal but only in line with the prewar and postwar tendency to increase constantly.

Other recent estimates of demand also have proved too low, several by 300,000 barrels daily for early 1947. On the conservative side, for example, were recent estimates of both the Interstate Oil Compact Commission and the Independent Petroleum Association of America.

"Barring a substantial business recession generally," added Swensrud, "I am inclined toward relatively high volume expectations for the next several years." Until a depression occurs, he predicted, "the trend of car (and gasoline) use will continue strong," and a similar outlook for domestic heating oil is foreseen. New oil burner installations and new automobiles so far are limited mainly by the number of units manufactured, it was pointed out.

Other demand factors to be considered include substitution of diesel for coal burning locomotives; prospective huge asphalt requirements for road building; increasing use of petroleum products in aviation; growing use of butane, propane, and other liquefied petroleum products.

"It does not seem to me, therefore," said Swensrud, "that we need to strain our imagination much to suppose that over the next several years (barring a depression or the development of exceptionally high prices for our products), the total demand for all petroleum products will exceed 5.5 million barrels per day, and that we will not have reached the end of the road then either."

Cradle Land of Oil Still A Lively Area

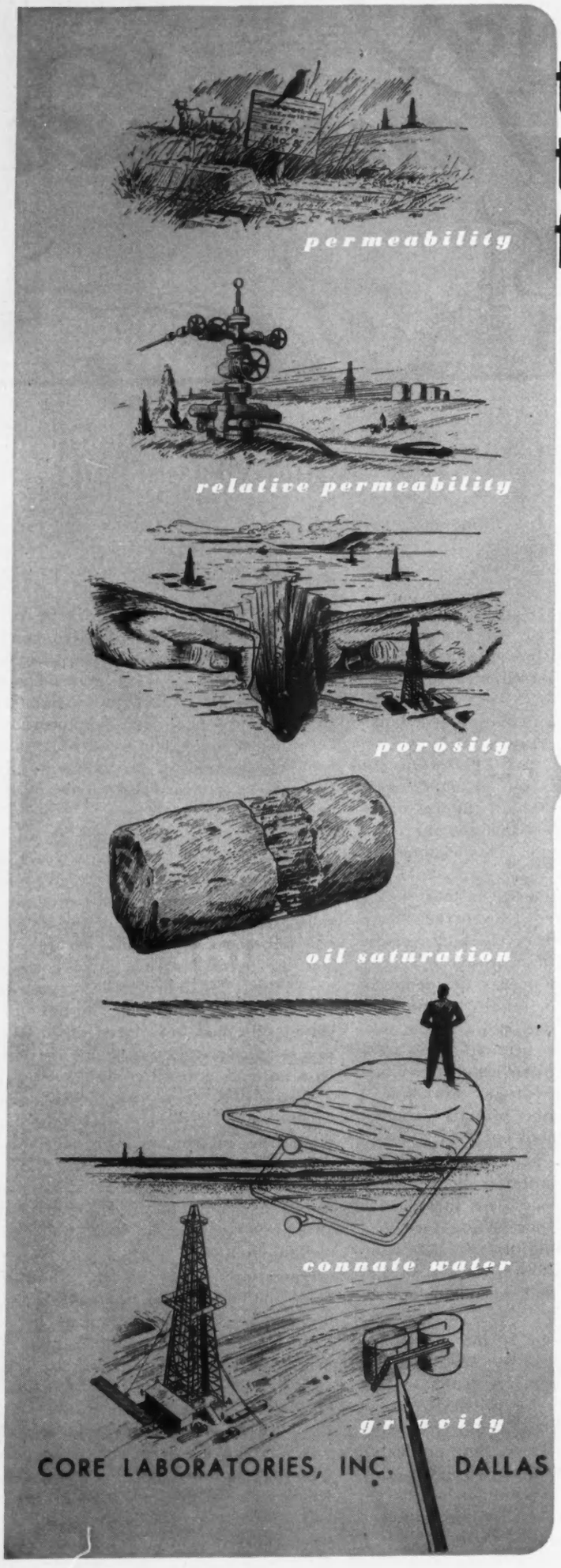
ALTHOUGH oil development in the United States spread gradually westward over the years and finally has become centered in the Southwest, the cradle land of the industry in the Appalachians still has active development and production and a favorable outlook. In 1946 production of Pennsylvania grade crude oil averaged approximately 62,187 barrels daily, the operators having arrested a declining trend which had been under way for several years. In 1945 the output had been only 59,016 barrels daily.

The increase in production is interpreted as the effect of several years of stabilized favorable prices received by producers. For an extended period subsidies represented a part of the income received, and since termination of price control, increased crude price postings have largely replaced subsidies. A recent further increase in postings all but eliminated subsidies and placed the market in a relatively attractive position strictly on a normal competitive basis.

While price has made development worth while, secondary recovery has made the maintenance of substantial production possible.

Including water intake wells, the state of Pennsylvania alone accounted for about one eighth of all U. S. well completions in 1946.

Operating mainly in the Bradford field, South Penn Oil Company ranked in 1946 as the No. 1 company in the United States in the number of wells drilled. It completed a total of 863 wells, of which there were 821 in secondary recovery development, principally in the Bradford district (394 oil wells and 427 water intake pressure wells). In addition, that company drilled 42 other wells, which included 9 oil wells, 28 gas wells, and 5 dry holes. Of these 42 wells, 14 were exploratory and wildcat wells.



theory to fact . . .

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THE WEEK'S NEWS

DIFFERENCES of opinion between members of the Federal Power Commission over interpretation of the "grandfather" clause of the National Gas Act and the right of the commission to provide competition widened with release by Commissioner Leland Olds of another dissenting opinion in the Michigan-Wisconsin case. Page 24.

Navy-Industry Plans—Cognizant of the uncertainties of the present "peace," top Navy officials plan to meet April 9 in Chicago with industrialists for a discussion of the Navy's industrial mobilization plan, designed to keep the country's production plants in a permanent state of readiness for war.

Tax Revenues Increase—Demonstrating the constantly increasing demand for oil, government revenues from the three petroleum taxes in the first two months of this year showed an increase of more than $15 million over the same period in 1946.

Middle East Probe—A new investigation of the Middle East oil situation has been opened by the Senate War Investigating Committee, using as a springboard charges that the Navy paid too much for Saudi Arabian oil during and since the war. Story below.

Imports Alarm IPAA—Imports of foreign oil reached a new all-time high in January at 491,000 barrels daily; IPAA says receipts show need for sound import program. Page 26.

April Allowable—Texas has upped April allowables to 2,338,102 barrels which is some 27,000 barrels more than the March figure. Louisiana's increase is 3193 barrels daily, April over March. Page 25.

Rubber Legislation—Congress approves retention of rubber controls pending the enactment of rubber-policy legislation; bill introduced to revive wartime alcohol-butadiene industry by taxing all other forms of rubber.

FPC and Natural Gas Act—The Federal Power Commission finally clamps down on interventions by coal and labor groups in apparent effort to show that proposed revision of the Natural Gas Act is unnecessary. Page 25.

Oil Congress Postponed—The first South American Oil Congress scheduled first in March and then in May at Lima, Peru, has been indefinitely postponed. Page 25.

Oil Pipe Situation—NPC may discuss acute drill pipe situation. Only governmental remedy would be through presidential order. Story below.

Lee Barrows Retires—The Texas Company's producing department will lose Lee Barrows April 1 through retirement. His successor as manager of the department will be E. R. Filley. Page 26.

Oil Profits for 1944—Income and excess profits taxes of $37,905,000 and dividends in cash and assets other than their own stocks amounting to $57,490,000 were paid on 1944 operations by 3523 corporations engaged in the production of crude petroleum and natural gas, according to preliminary figures just released by the Bureau of Internal Revenue.

National Council Likely to Discuss Acute Drill Pipe Situation at Meet

Oil and Gas division officials, deeply concerned over the drill pipe situation, are probing for a remedy and are expected shortly to take the question up with Walter S. Hallan, chairman of the National Petroleum Council, with a view to having the Agenda Committee provide for its consideration at next month's meeting.

Outside of possible action from the White House to establish a priority system, which is highly unlikely in view of the fact that wartime controls are being sloughed off as fast as possible, officials saw no action which the government could take to relieve the situation.

In a report to the January meeting of the council, its Materials Committee commented on the confusion in the supply market which, more than a year after the cessation of hostilities, made it more difficult to get needed commodities than at any time during the war. The committee, however, took the position that the elimination of priorities and production uninterrupted by strikes would remedy the situation; since then there have been no strikes in the steel industry and production has been at a high level, but the supply position has shown no improvement.

The Materials Committee report contained no statistical analysis of supply or requirements, and it is probable that OGD will ask that such data be developed by the fact-finding committee now studying large-diameter line pipe.

CPA, which has been handling steel and other problems, is in process of liquidation and in no position to give any assistance, as a result, if the government were to intervene, it could do so only by presidential order.

A major factor in the situation is the competition of other industries for pipe of the types and sizes used by the oil industry in its drilling operations. Much of the pipe is believed to be going into residential and commercial construction, into industrial plants, water lines and other uses, officials believe. They also think it possible that distribution is unbalanced, but admit that nothing less than a national survey would develop whether that is the case.

If the matter comes up at the next NPC meeting, the council probably will be asked to set up a committee to make a thorough investigation, develop the facts and, if possible, recommend what can be done to insure a steady and adequate supply of pipe for development work.

Probe of Middle East Oil Seen by Senate Committee

The Senate War Investigating Committee laid the groundwork last week for an all-out investigation of the Saudi Arabian oil situation and purchases by the Navy from Arabian American Oil Company, after hearing charges by James A. Moffett, former chairman of the board of Bahrein Oil Company and California-Texas Oil Company, Ltd., that the Navy since 1944 has been paying three times as much for the oil as was asked in 1941.

Moffett submitted estimates that had the government accepted the proposal made by him to President Roosevelt before the war, the company would have made only a fraction of the $68 million by which he said it has profited under its contracts. The profits of the Navy purchases, he said, have wiped out the $70 million which it invested in the properties and refinery "at the expense of the American taxpayer."

Moffett submitted a copy of a letter in which he sought the aid of President Roosevelt in providing the $6 million a year which Ibn Saud demanded of the company in 1941, when it felt it could not stand the burden. In conversations with the President and the late Secretary of the Navy Knox, he said, he suggested first that the government buy an interest in oil in the ground as a reserve, and then that it buy oil products to the extent of the $6 million a year. Neither suggestion was adopted but in 1944 the Navy began taking large quantities of Arabian oil at higher prices than quoted in 1941.

A Navy official, Captain Chester C. Wood, said that original documents in the case had been sent to the White House in 1944 at the request of the President and are now in the possession of the executors of his estate, who will release them only at the request of President Truman. The department, he

said, had no copies of them in its files.

Following the hearing, Chairman Owen Brewster of Maine told reporters that he plans to investigate the entire picture, including the proposal during the war for a government-financed pipe line, the possible relation of the pending Anglo-American petroleum agreement and a cartel to which Moffett referred, covering distribution of Middle East oil, and will probably call former Interior Secretary Ickes, as well as State and Navy department officials.

Brewster said the company stands to make a profit of $10 billion or more from the Saudi Arabian concession and, he added, "the thing which disturbs me is that we are apparently taking over this situation to protect our interest. I think we should have the protection so the government can share in the benefits. It should have the oil at a very low figure.

"There are a good many angles to the matter, but the net result today is we are not getting the benefit of the government's contribution."

The British, Brewster said, are buying Middle East oil at 40 percent of the price paid by the Navy.

Moffett made no charges of wrongdoing by any naval officers, but Brewster had Captain Wood testify that Vice Admiral W. J. Carter was chief of the bureau of supplies and accounts at the same time his brother, Rear Admiral Andrew F. Carter, was executive officer of the Army-Navy Petroleum Board. Both men are now retired, the latter president of Overseas Tankship Corporation and the former connected with Bernard E. Smith.

Synthol Processes' Effect On Oil Industry Detailed

Development of the present "Hydrocol" process probably will have a considerable effect on the oil industry by making the United States independent of natural gas and petroleum reserves as the only source of liquid fuels, P. C. Keith, president of Hydrocarbon Research Corporation, said last week in an address before the Western Petroleum Refiners Association at San Antonio.

Keith also suggested that the "Hydrocol" process as being of utility to petroleum refiners in realizing maximum yields from crude oils. He explained that little investigation along these lines has been completed, but that preliminary examinations indicate the economic utility of the process as a "scavenger" for all low-value refinery hydrocarbons.

Outside of alkylation and polymerization, the "Hydrocol" process, Keith asserted, is the only process by which a refiner can enhance quality of his product without a corresponding decrease in yield through operating on refinery gases and heavy residues now burned for process fuels.

Secretary of the Interior Krug, in a message, said the Interior's oil and gas division has no power or desire to "control" the oil industry.

"Petroleum and Natural Gas — Uses and Possible Replacements," by R. E. Wilson and J. K. Roberts of Standard Oil Company (Indiana), was presented by Dr. Roberts describing sources of oil, gas, gasoline, and other petroleum products, and for coal as follows: 24 billion barrels of proved petroleum oil reserves, imports from foreign producing areas which are expected to play a part of increasing importance, and synthetic fuels to be produced by "synthol" type processes which will also provide by-product petroleum chemicals. It was forecast that "synthol" plants—adaptations and improvements of the old German Fischer-Tropsch process — would appear in this country in commercial operation somewhat along this timetable:

"Synthol" plants utilizing natural gas as feed stock, 1947; "Synthol" plants utilizing residual fuel oils as feed, 1965; "Synthol" plants utilizing coal as feed, 1970.

Plan for Making Gasoline and Gas Fuel from Bituminous Coal Detailed

Plans for a research and development program which may lead to the creation of a new fuel industry have been announced by Pittsburgh Consolidation Coal Company and Standard Oil Development Company, the latter the central technical organization of Standard Oil Company (New Jersey).

Aim of the program is to perfect commercial processes for making gasoline and gas fuel of high heat value from bituminous coal. Commercial gasification and liquidification plants costing as much as $120 million per unit may result from this project, the companies announced.

Studies of coal carbonization are being carried out in a pilot plant at the Disco unit of Pittsburgh Consolidation near Pittsburgh. Engineering studies and designs are under way for an additional pilot plant for the purpose of studying the complete gasification of coal. This latter plant, located at Library, Penn., near Pittsburgh, should be ready for operation by the year's end. Necessary arrangements to cover licensing of patents which may result from these studies are under discussion by the two companies.

Wartime Development

The fluidized solids technique is a war-developed refinery process, created by Standard Oil Development Company scientists to give Allied planes a gasoline of superior power. The process was used during the war to speed production of 100-octane aviation fuel.

As applied in the oil industry, the fluidized solids technique utilizes a catalyst, a substance which speeds up or directs chemical reactions without being changed itself. The fluidized solids technique is so named because in the refinery process a finely divided solid catalyst is used which, when agitated by air or oil vapors, actually behaves like a fluid.

Robert P. Russell, president of Standard Development, said that if the pilot plant operates as expected, the resulting gas could be converted directly into high-octane gasoline, diesel fuels, chemicals, and chemical raw materials by still a third process on which the company has been working for several years.

"Production of gasoline from coal by the synthesis process would result in costs higher than production from crude oil, but should this development take place the average motorist could operate his car at an added cost of not more than 10 cents a day even under present conditions," he declared.

Any large-scale production of synthetic oil from coal, comparable with the country's present production of petroleum, would require huge capital expenditures and a mammoth construction program which would extend over a period of years, Russell said.

George H. Love, president of Pittsburgh Consolidation, said the two companies had also made arrangements to contribute to the studies of Hydrocarbon Research, Inc., headed by P. C. Keith.

Joseph Prusglove, Jr., vice president of Pittsburgh Consolidation, said the Library pilot plant, to cost an estimated $300,000, would consume about 50 tons of coal a day and from this will come a daily production of about 2.4 million cubic feet of gas suitable for synthesis into liquid fuels and into a gas fuel of high heat value.

Michigan-Wisconsin Case Provokes Further Dissent

Federal Power Commissioner Leland Olds last week issued another dissenting opinion in the Michigan-Wisconsin Pipe Line Company case in which, in effect, he charged the majority with participating with that company in a freeze-out of Panhandle Eastern Pipe Line Company from the Detroit and Ann Arbor markets.

The fight over Panhandle's rights under its "grandfather" clause has been raging since the commission last year approved Michigan-Wisconsin's application for authority to construct a new pipe line to serve the Detroit-Ann Arbor area and followed up with a supplementary opinion limiting Panhandle's operations in that area in such a way as to provide a market for the new line.

Olds charged that Michigan-Wisconsin originally proposed to take the entire Michigan Consolidated, Detroit and Ann Arbor markets away from Panhandle at the termination of its contract in 1951, but that when it appeared some recognition must be given to Panhandle's rights it proposed to contract to purchase 32,000,000 Mcf per year from Panhandle for 15 years.

By refusing to act upon that offer, Panhandle forced the commission to decide whether it would aid Michigan-Wisconsin to seize those markets, apparently with a view to the court proceedings which are expected.

Texas April Production Up 27,000 Barrels Daily

The Texas Railroad Commission has issued its April order fixing a net allowable of 2,338,102 barrels daily, an increase of 26,975 barrels over March.

West Texas was increased 7205 barrels daily and East Texas field was upped 25,004 barrels. Southwest Texas was cut 1830 barrels, and the Gulf Coast is down 2305.

The state as a whole, which produced 27 days during March, will produced 26 days in April. West Texas continues on 18 days, East Texas was increased from 21 to 22, and the Panhandle is exempt.

The commission estimates operators will produce 6.50 percent less oil than allowed which will mean actual production of 2,186,125 barrels. To this will be added 188,375 barrels of distillate and natural gasoline, bringing the state total to 2,374,500 barrels of all oils. The Bureau of Mines forecast a Texas April demand of 2,120,000 barrels.

Commission Chairman Ernest O. Thompson said that other oil was made available in the April order to balance an anticipated decrease in production from the Seeligson field. This cut is expected to result from the recent anti-gas waste order.

The next statewide hearing will be held April 18 at the Plaza Hotel in San Antonio.

Hotel and Other Factors Cause Oil Congress Delay

The first South American Oil Congress, scheduled in Lima, Peru, on May 12-17, has been postponed indefinitely, THE OIL WEEKLY was advised last week by its representative in Lima.

Decision to postpone was charged to acute shortage of hotel accomodations, but THE OIL WEEKLY learned that perhaps more potent factors were 1) to give more time to interest all South American countries in the gathering; 2) the conflicting proposals of American oil interests and 3) the determined drive by the Argentine government to impose its ideas regarding government-controlled oil fields in Chile, Peru and Bolivia.

Argentina recently has signed commercial treaties with sweeping ramifications with Chile and Bolivia, and an Argentine mission visited Lima recently for the purpose of negotiating a similar treaty with Peru.

Government officials in Peru are committed to the program favoring American oil company investments, as insuring more rapid and efficient development of Peruvian petroleum resources. Both the "Sechura contract" with International Petroleum Company and the new general oil law are due to come up for consideration by the next Peruvian Congress which convenes July 28.

The concensus in oil circles in Lima is that an oil congress at this time would merely serve as a sounding board for the Argentine theory and would be detrimental to the present program of the government.

Another committee meeting will be held shortly to try to determine the date for the oil congress with Lima reported assured as the meeting place.

There is no debate as to Lima's short hotel accomodations. This was indicated recently when the Inter-American Bar Association's conference, scheduled there in April, was postponed until the latter part of November. A new and modern hotel will be completed in August with 200 rooms, to supplement the 300-room Hotel Bolivar, Lima's only first class establishment.

TXL Plant Plans

Shell Oil Company's TXL gasoline plant, being constructed in the TXL field of Ector County, West Texas, is scheduled to be completed by the end of 1947. The plant will process between 30 million and 40 million cubic feet of gas daily. Wheeler Ranch field, Winkler County, gas will also be processed.

Extraction of propane, butane, and 26RVP (Reid Vapor Pressure) gasoline will be accomplished by use of eight 800-horsepower gas engine compressors and three 8000-horsepower gas-engine generators. Storage will handle 27,000 barrels of manufactured products, with residue gas being contracted for by El Paso Natural Gas Company.

Crude Oil Production in the United States

(Estimates compiled by THE OIL WEEKLY. All figures indicate daily averages in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED March 29	March 22
Alabama	950	950
Arkansas	74,500	74,000
California	905,800	909,400
Colorado	37,000	34,000
Florida	650	740
Illinois	190,900	187,100
Indiana	18,000	17,000
Kansas	281,150	267,750
Kentucky	27,000	26,750
Louisiana	407,450	406,250
North Louisiana	96,000	94,800
South Louisiana	311,450	311,450
Michigan	41,500	42,500
Mississippi	87,750	88,850
Missouri	100	100
Montana	22,500	22,600
Nebraska	650	650
New Mexico	104,400	104,400
New York	13,200	13,200
Ohio	9,100	8,500
Oklahoma	370,400	367,850
Pennsylvania	34,800	34,800
Tennessee	25	25
Texas	2,129,750	2,129,750
Tex. R. R. Comm. Districts:		
Dist. 1—South Central	20,550	20,550
Dist. 2—Middle Gulf Coast	157,900	157,900
Dist. 3—Upper Gulf Coast	487,300	487,300
Dist. 4—Lower Gulf-S.W.	242,000	242,000
Dist. 5—East Central	38,300	38,300
Dist. 6—East Texas Field	313,000	313,000
Dist. 6—Rest of Northeast	111,000	111,000
Dist. 7-B—North Central	36,425	36,425
Dist. 7-C—West Central	34,900	34,900
Dist. 8—West	473,725	473,725
Dist. 9—North	130,000	130,000
Dist. 10—Panhandle	84,650	84,650
West Virginia	7,500	7,500
Wyoming	111,000	109,000
Total United States	4,876,075	4,853,665

Total stocks, foreign and domestic, March 22, as reported by the Bureau of Mines were 225,720,000.

Pipe Cutting Continues In World's Deepest Well

Crew was still cutting pipe at the world's deepest test March 28, after previous attempts had failed.

The well is Superior Oil Company of California's Weller 51-11, NW NW NE 11-8n-12w, near Fort Cobb in Caddo County, Oklahoma. Drill pipe became stuck March 15 about 25 feet off bottom of the hole, with total depth 17,236 feet. For a week the crew has been cutting on the pipe at approximately 16,936 feet. When pipe is cut and pulled, operators will either fish for drill collars or set whipstock and by-pass the remaining pipe.

Edwin L. Smith of Superior's Oklahoma City office, denied reports that a good show of oil was found in the Mississippian formation. He also denied there were gas showings up the hole.

"Hot shot" plane service has been maintained between Houston and the well, men and equipment being flown several times. Daylight landings were made alongside the rig.

Gas Policy Changed

A gas allowable has been granted for the Lucky field in Louisiana by Conservation Commissioner McHugh and H. L. Hunt thus will be permitted to withdraw 55 million cubic feet daily for transportation to the East through the Little Big Inch pipe line.

The state's anti-export policy was terminated when the legislature voted to repeal it and to abolish the office of gas conservation. It was thought that the state conservation act, administered by McHugh, is adequate to prevent waste and gas conservation is now put under his control.

Louisiana Allowable

Louisiana Conservation Commission has fixed that state's April allowable at 452,811 barrels daily, an increase of 3193 barrels daily over March. Increases were ordered for all of the districts except Lake Charles, which was reduced 725 barrels to 64,978.

Other district totals and their increases were Houma, 65,549, up 1388; Lafayette, 123,528, up 1356; New Orleans, 94,737, up 762; Monroe, 68,134, up 396, and Shreveport, 36,065, up 16.

Coal Intervention Denied

A further effort by FPC to modify its procedures so as to eliminate necessity of congressional revision of the Natural Gas Act was seen last week in a denial of requests of the National Coal Association and the United Mine Workers to intervene in the proposed acquisition of the properties of Kentucky Natural Gas Corporation by Memphis Natural Gas Company as the first step toward construction of a Texas-to-Pittsburgh pipe line by the latter.

Hearings will open April 1. Intervention was denied on the grounds that interests represented by the two applicants will not be affected by the merger.

Secondary-Recovery Meeting April 28

All groups and individuals interested in secondary recovery from either the operating or engineering viewpoint will be invited to attend a joint meeting to be held in Washington by the Oil and Gas Division and Interstate Oil Compact Commission April 28.

Purpose of the meeting is to develop a basis for a better interchange of information on secondary-recovery operations, survey the present extent of such work and, discuss plans for possible wider adoption of such activities.

OGD Studying Fuel Oil And Gasoline Situation

OGD officials are beginning to worry about the summer gasoline supply and next winter's fuel oil supplies. A large number of complaints of inability to procure needed fuel oil indicate that there may be some shortages of gasoline this summer.

Many such communications have been received by congressmen who have been advised by OGD that there have been some shortages of fuel oil but that they have been spotty and the situation will clear up with the reduced demand of the now-ending heating situation.

The OGD, however, has begun a serious study of the immediate outlook for gasoline and the long-range outlook for heating oil, anticipating that the demand next winter will be considerably above the unprecedented requirements this year.

Comment Sought by FPC

The FPC is distributing, for industry comment, a proposed rule defining service areas of natural gas companies within which they would be permitted, without specific authorization from the commission, to make limited extensions or enlargements of facilities to meet increased market demand. The rule was recommended in a commission staff report last January.

Barrows Retires, Changes Listed by Texas Company

E. R. Filley

Lee E. Barrows

A. R. Wilson

J. N. Troxell

Lee E. Barrows, manager since 1935 of The Texas Company's producing department and its operations throughout the United States east of California, will retire April 1. He has been with the company for 38 years.

Succeeding Barrows will be E. R. Filley, who has served since 1938 as assistant manager of the producing department.

Other changes include: A. R. Wilson advanced from assistant to the manager to assistant manager of the producing department; J. N. Troxell appointed assistant manager, while retaining his present post of departmental geologist; L. J. Whetsell named assistant to the manager in charge of industrial relations; and J. W. Foley of New Orleans transferred to Houston as assistant to the manager.

Barrows, a native of Yorkshire, N. Y., graduated from Cornell University in 1907 with a degree in mechanical engineering. He entered the service of The Texas Company in 1909. In 1919 he became superintendent of gasoline plants and later became assistant to the manager to general superintendent of the old North Central Texas division. In 1926 he became division manager when the division was enlarged to take in West Texas and New Mexico. In 1933 he was appointed assistant to the manager of the producing department and in December, 1935, was advanced to the head.

Filley, new manager of the producing department, was born in Filley, Nebr., and is a graduate of Baker University, Baldwin, Kan. He began his career with The Texas Company as a clerk at Tulsa.

Wilson, a native Texan, and an alumnus of Southwestern University at Georgetown and the Colorado School of Mines, has been with the company since 1916. He became assistant to the manager at Houston in 1936.

Troxell is a native of Ridgeway, Pa., a graduate of the University of Pittsburgh, joined the company in 1922 and has been departmental geologist since 1943.

Whetsell is a graduate of Southeastern State Teachers College, Durant, Okla. With The Texas Company since 1934, he was safety engineer and later zone supervisor of safety at Tulsa before coming to the Houston production office in 1940.

J. W. Foley, a native Texan, is a graduate of Texas A. & M., started with the company in 1932 and was superintendent of gas and gasoline plants in the Louisiana division before being appointed to his new position.

April Hearings Called On Colorado, Michigan Cases

The Federal Power Commission will hold a hearing at Denver April 21 on the applications of Colorado Interstate Gas Company and Colorado-Wyoming Gas Company for construction by the former of 240 miles of 20-inch line from Denver to a proposed compressor station near Lakin, Kan., at a cost of $12 million, and by the latter of 105 miles of 8 and 10-inch line from the proposed Denver line to Cheyenne, Wyo., with one 1200-horsepower compressor station.

Hearings will be open April 14, on the applications of Austin Field Pipe Line Company and Michigan Consolidated Gas Company. The former proposes construction of 140 miles of 26-inch line line between the Austin storage field and a proposed metering station to be built by Michigan Consolidated in its Detroit district; 22 miles of 24-inch line between the Austin field and the Reed City field; approximately 40 miles of lateral line and a gas compressor station and dehydration plant. Michigan Consolidated plans 27 gas wells, 8 dry holes, 40 wellhead-piping-and-structure units, 40 well heaters and 42,000 feet of lines in the Austin field, and two groups of facilities in the Reed City field. These include 59 gas wells and 115,000 feet of field lines.

January Imports at New High

Petroleum imports in January reached a new high of 491,000 barrels daily, an analysis last week by IPAA of Commerce Department import statistics showed.

Total imports for the month were 15,220,000 barrels, an increase of more than 1.5 million barrels over December, of which 8,956,000 barrels was crude and 6,264,000 barrels refined products. Principal product was residual fuel oil, of which 5,586,000 barrels was imported.

More than half, 7,710,000 barrels, was from Venezuela, but 5,534,000 barrels was imported from the Netherlands West Indies, 980,000 barrels from Colombia and 802,000 barrels from Mexico. Trinidad and Tobago sent 11,000 barrels of oil and all other sources, 183,000 barrels.

Russell B. Brown, general counsel of the IPAA, pointed out that the Commerce Department had reported a drop in Venezuelan production in December because some wells were shut down for lack of markets.

"This is an indication of how surplus quantities of low-cost foreign oil may be seeking markets to an increasing extent in the future," he said. "Here's a real threat to the conservation of our domestic reserves and shows the need for a sound import program."

Mextex to Up Capacity of West Texas-Borger Line

Mextex Pipe Line Company, subsidiary of Phillips Petroleum Company, will increase the capacity of its 8-inch trunk line from West Texas to Borger, Texas, to 25,000 barrels daily by installing booster stations near the Fullerton field, Andrews County, and Olton, Lamb County. This carrier, built originally to handle natural gasoline from plants in West Texas and Southeastern New Mexico for use in Phillips' Borger refinery, has been transporting 5000 barrels of crude daily since early February. This arrangement may have some bearing on Phillips' proceeding, when pipe is available, with construction of its projected 289-mile 12-inch crude line from West Texas to Borger.

Mextex Gathering Lines, subsidiary of Phillips recently formed as a noncommon carrier to succeed Standish Pipe Line Company, except in the Goldsmith area, in supplying crude for movement through the products line, is installing 4-inch crude gathering system in the Fullerton and Fullerton-Devonian fields. Phillips controls 3100 barrels daily of semi-sweet crude in these areas. Mextex will build a 5-mile 6-inch discharge line from its field gathering station to connect with the trunk line to Borger. Natural gasoline shipments to Borger average 9000 barrels daily.

Continental North Texas System to Be Extended

Continental Pipe Line Company has purchased right-of-way for the extension of its North Texas crude system from the Ewalt field, Throckmorton County, to the Sztygold pool, involving 8 miles of combination 4- and 3-inch line.

Continental has placed in operation its 14-mile 4-inch gathering system in the Hildreth and Lewis-Stuart fields, Montague County, where the company controls 4000 barrels of high-gravity oil daily. The gatherings are delivered to Magnolia Pipe Line Company's near-by trunk line under an arrangement whereby Magnolia makes available 1500 barrels daily of South Louisiana crude for Continental's Lake Charles refinery.

Kansas Hearing Resumed

Construction of a proposed 405-mile pipe line by Cities Service Gas Company from Grant County, Kansas, to Kansas City would increase the utility's sales and gross receipts within the next three years, but would reduce net income, witnesses testified in the FPC hearing, resumed at Kansas City.

Cities Service seeks permission to build the 26-inch line, costing $30,681,050, and improvements to existing facilities which would bring the total outlay to $47,724,150 through 1950, to increase delivery capacity in Kansas City and Wichita.

A total of 221 exhibits has been introduced in the consolidated hearing. That part of the hearing covering Northern Natural Gas Company's application to enter the St. Paul market, concluded February 10, awaits a decision from Washington. Mid-Continent Gas Transmission Company of St. Paul has asked to withdraw an application for a line from Hugoton field to St. Paul.

SECTION OF "BIGGEST INCH"

Section of the high-pressure 30-inch gas transmission line being built in California by Southern California Gas Company and Southern Counties Gas Company. View is southward over the desert from Blythe, the line running 214 miles from Blythe to Santa Fe Springs near Los Angeles. At Blythe the California link will connect with a 26-inch line being built by El Paso Natural Gas Company to bring gas from Texas fields. The project is scheduled for completion and operation this coming winter. The California section is being constructed by the H. C. Price Company, Bartlesville, Oklahoma. —(Acme Photo)

East Texas Connection Is Completed by Humble

Humble Pipe Line Company has completed construction of a 42-mile 6-inch crude line extension from its East Texas terminal at Longview to the Pittsburg field, Camp County, with connections being made to the Pickton, Winnsboro and New Hope fields.

These deep areas produce 7000 barrels daily of high-gravity crude. Humble will acquire the field gathering systems installed by Gulf Refining Company, pipe line division, which will be supplied with an equal volume of East Texas field crude in return for surrendering the connections. Tide Water Associated Oil Company, which controls the market outlet on the bulk of the 75 wells in the New Hope field, will be delivered Oklahoma crude by Gulf in return for making this oil available to Humble.

Boosters Are Installed On West Texas Carrier

Stanolind Pipe Line Company has placed in service two booster stations on its 16-inch carrier from Wasson field, West Texas, to Drumright, Okla., thereby increasing the capacity from 70,000 to 80,000 barrels daily. The new boosters are located near Childress, Texas, and El Reno, Okla. Additional pumping units being installed at Slaughter field station, original West Texas terminal, are expected to boost the capacity of the 420-mile line to 86,000 barrels daily.

Extension of Stanolind's trunk line from Wasson field south to the Fullerton and Wheeler fields, involving 80 miles of 16-inch line, may be postponed until late summer due to manufacturers inability to supply pipe.

Colorado Line Asked

Superior Oil Company of California has asked permit to build 60 miles of 8-inch gas line from the Douglas Creek field to Grand Junction, Colo. Market for the gas has been assured by Public Service Company of Colorado, distributor in Grand Junction, provided sufficient reserves are developed.

Douglas Creek was discovered in 1943 by Superior in a joint operation with Continental Oil Company and Union Oil Company of California.

To Move Loading Rack

The Texas New Mexico Pipe Line Company has purchased Humble Oil & Refining Company's 76-car capacity tank car rack and loading facilities at Midland, Texas, for removal to a point near Jal, N. M., for use in supplementing its pipe line shipments of crude from Eddy and Lea counties, N. M.

Tank car shipments of crude from West Texas and Southeastern New Mexico fields to refineries in Canada, Kansas and El Paso averaged 5760 barrels daily the past week as compared with 9570 barrels daily the previous week. Standard Oil Company of Texas has discontinued rail shipments from Wickett, Texas, to its El Paso refinery.

API Production Division Meet

B. J. Dowd named chairman for year as Southwestern District holds is annual sessions

By ELTON STERRETT
Engineering Editor

FEATURING the operating problems of the area in which the meeting was held, the Southwestern District of the American Petroleum Institute, Division of Production, met last week in Fort Worth to hear three papers on drilling subjects, two on completion practices, and two on secondary recovery methods.

At the opening general session, presided over by the general chairman, W. V. Vietti, The Texas Company, Houston, and the program chairman, B. J. Dowd, Union Producing Company, Shreveport, La., the group heard Mayor Roscoe L. Carnrike, of Fort Worth, and the vice president, API Division of Production, Jake L. Hamon. Addresses by Walace Hawkins, Magnolia Petroleum Company, and Ralph C. Champlin, Ethyl Corporation, completed the opening session.

T. W. Rhoads, Gulf Oil Corporation, Fort Worth, and Professor George H. Fancher, University of Texas, Austin, presided at the Friday morning session.

Officers of the Southwestern District API Division of Production were elected as follows: B. J. Dowd, Union Producing Company, Shreveport, La., chairman; John S. Boldrick, Humble Oil & Refining Company, New Orleans, vice chairman, Southern Louisiana; J. E. Warren, Carl B. King Drilling Company, Midland, vice chairman, West Texas and New Mexico; J. N. Miles, Cities Service Oil Company, Gladewater, vice chairman, East Texas; V. J. Martzell, Rosenbloom Pipe and Supply Company, Shreveport, vice chairman, Arkansas and Northern Louisiana; Roland Gouldy, Bridwell Oil Company, Wichita Falls, vice chairman, North Texas; Jim Teague, Hogg Oil Company, Houston, vice chairman, Texas Gulf Coast; T. R. Bybee, Gulf Oil Company, Heidelberg, Miss., vice chairman, Alabama-Mississippi; R. S. Christie, Amerada Petroleum Company, Fort Worth, secretary-treasurer; W. V. Vietti, The Texas Company, Houston, chairman of advisory committee.

At the afternoon session co-chairmen were D. L. Harlan, The Texas Company, Fort Worth, and C. W. Faris, Shell Oil Company, Inc., Midland.

Digests of the technical papers and the addresses by Hawkins and Champlin follow.

Case History of Water Flooding in Throckmorton County, Texas

By PAUL C. DEAN, Dean Bros., Fort Worth.

The Woodson shallow field, in North Central Texas, was discovered in 1929, and when fully developed had 184 oil wells covering 400 acres. The producing formation, the upper Tannehill sand, lower Permian, was found at about 350 feet. The reservoir energy was dissolved gas which was rapidly exhausted, and by the time water flooding was commenced in 1941, more than half the wells had been plugged and the remainder were being operated at a loss.

The flood was installed and operated along conventional lines, using water from a nearby lake at first, and later mixing with the fresh, salt water which was produced with the oil. Forty-four injection wells were used, and 185 acres flooded. The formation took water readily and up to January 1, 1947, a total of 4,145,049 barrels of water had been injected.

As of January 1, 1947, water-flooding recovery figures showed 288,964 barrels of oil recovered, with production still averaging 160 barrels per day. The oldest flood in the field, the Davis lease, is now being abandoned, after having recovered by flooding twice as much oil as was produced prior to introduction of the flood. The other two leases in the field are estimated to have several more years of producing life.

A close spacing pattern was used on the Davis lease, with inputs 300 feet apart; while on the Odell lease the spacing was 600 feet. Present indications are that the wide spacing will recover more oil per acre than the close spacing, and this method certainly will be more profitable, due to lower installation, equipment and lifting costs.

The Flow Properties of Drilling Muds

By R. W. BECK, Creole Petroleum Company, Maracaibo, Venezuela, and W. F. NUSS and T. H. DUNN, Stanolind Oil and Gas Company, Tulsa.

It is generally recognized that drilling muds have a more complex flow behavior than true fluids, yet it is still common to express the flow properties of muds in terms of a single viscosity value. Notwithstanding past work conducted on plastic flow, there appeared to be a gap between theory and its general application to problems involving the use of drilling muds. The investigation described by the authors was undertaken for the purpose of developing a simple method of determining flow characteristics and applying this information to drilling practice.

Laboratory and field instruments developed for determination of drilling mud flow characteristics are described, and the calibration of these instruments by comparison with results of pipe flow tests is included.

Three conclusions may be drawn from the work: 1) the flow characteristics of any drilling mud can be defined in terms of two constants, the yield value and rigidity, which are independent of the dimensions of the pipe through which the mud is flowing; 2) it has been verified experimentally that the two constants necessary to define flow properties of muds can be determined with certain types of rotational or funnel viscosimeters; and, 3) knowledge of the hydrodynamic properties of muds should prove a valuable tool in the solution of numerous drilling problems.

Well Completion and Remedial Work With Plastic

By A. A. TOWNSEND and R. H. SMITH, Dowell Inc.

Plastics have now been used in more than 5000 wells as a part of the well-completion or serving operation. These materials are true fluids when introduced into the well, and subsequently polymerize into a solid having a hardness comparable with neat cement. At the same time, the plastic will bond with both formation and pipe wall. There are now three different plastics available to meet well temperatures ranging from 50 to 350 degrees, Fahr. Each will solidify in an average time, under average well conditions, of approximately eight hours.

Filler plastics have been used to repair cement failures; for shutting off excess water and/or gas; for setting blank liners; for setting casing; for zone abandonment; for setting bridge plugs; for repairing casing leaks; for consolidation of loose sands; and for multi-zone testing. A brief description of present methods for applying plastic to each of these uses is given.

It is highly important to insure that the well be properly conditioned to prevent contamination of the plastic material, and to insure a good bond between plastic and both pipe and formation.

Progress Report on Your Public Relations Program

By RALPH C. CHAMPLIN, Director of Public Relations, Ethyl Corporation, New York.

The speaker first traced the initial impressions which the oil industry created in the public mind nearly 100 years ago, paying tribute to the pioneers who developed the first oil production and who, at the same time, started the distinct line of industry which, for better or worse, has been singled out by the public as an entity, and judged on the performance of a few.

Tracing the work of the industry's present committee on public relations, the paper detailed various types of publicity which have been developed and made available for reaching all types of employes of various branches of the oil industry, that these employes may know and foster the work of the committee. Mention was also made of the work now initiated with more than a score of oil-industry organizations, with extension to the other 150 kindred organizations planned and under way.

"The public relations program offers a great field of endeavor," the speaker concluded. "It offers the challenge to every person engaged in the oil business to better acquaint himself, his employes, his friends and all others with whom he comes in contact, with the special significance of the oil business. It offers us a chance to make the second hundred years of the oil business better than the first. Our keynote is progress. Our eyes are on tomorrow."

Packer Problems in West Texas

By T. H. DWYER, Shell Oil Company, Inc., Midland, Texas.

This paper reviews the more common packer problems confronting operators in the West Texas area and discusses the methods and equipment employed to solve them.

Packer problems are classified into two groups: 1) casing packer problems; and 2) open-hole packer problems. Within each of these groups, the author discusses packers in the order of the ease of the solution of the problems. To

facilitate the solution of problems in either group, certain running, setting and removal practices are suggested.

Present problems involving casing packers are solved with relative ease, while those dealing with open hole packers present several difficulties. Recent improvements in packers and related equipment are gradually eliminating these difficulties, but the problem of positive removal of packers without difficulty still remains substantially unsolved.

There is need for new and improved packer equipment to meet the difficult working conditions encountered in open-hole formation testing. As indication of the possible trend in future packer design, a tool being designed at this time to meet open-hole needs is described.

Hard Rock Drilling in the Permian Basin

By DAVID JOHNSTON, Humble Oil & Refining Company, Midland, Texas.

It has been reported that the Permian Basin area of West Texas and New Mexico has larger petroleum reserves than any area of similar size in the United States. The newer reserves that are being developed lie primarily in zones deeper than the Permian formations from which the area takes its name. Many fields are now producing from six or seven formations of three or four geologic ages. This diversity of producing horizons provides a great variation in drilling problems.

In the Permian Basin costs are reported to have increased over 100 percent from 1939 to 1946. During 1946, drilling rig operating costs have continued to increase, but reductions in drilling time have reduced total well costs below the 1945 average. Changes in drilling practice which brought about the time reduction are use of increased weight on bits with slower rotating speed; mud control designed for hole conditions actually encountered; an improvement in the quality and quantity of drilling labor; and a high percentage of new equipment.

Possible future changes in drilling equipment and drilling practices are outlined. Future practices and equipment must continue to reduce drilling costs or the expense of replacement of reserves in the Permian basin will be excessive.

The Natural Gas Act and the Oil and Gas Producer

By WALACE HAWKINS, Vice-President and General Counsel, Magnolia Petroleum Company, Dallas.

The speaker first considered the Federal Power Commission program, which in 1945 proclaimed that imposition of public utility status on the oil and gas producer was necessary. The second phase takes up the extension of jurisdiction without judicial review, through which the commission accomplished the fact of federal control—in the absence of law authorizing it. In effect, there was control of the oil and gas industry by a national bureau whose power is limited to the regulation of interstate transmission of gas and sale thereof after such transportation.

Bills pending in the Congress are written to restore the Natural Gas Act to its original proportions and purposes. The commission's staff, in a recent report, concludes that the Congress is incompetent to define jurisdictional transportation. Another conclusion, put forward by the staff in its report seems to be that the "shall not" production and gathering clause immunizes from commission regulation some producers and gatherers but not others. "Congress excluded from commission regulation 'production and gathering' without regard to who the producer or gatherer was . . . without reference to whether the producer owned or did not own a pipe line," the speaker emphasized.

Discussing anti-FPC activities, the speaker cited the 342-page reports of the staff, as evidence that the commission, among other things, apparently opposes any attempt by the Congress to define its jurisdiction. The question arises with respect to the expression and advocacy of views contrary to those advocated by the commission. Many producers remain silent because of fear of retaliation. Oil and gas producers do not have a ready, adequate or effective defense against retaliatory activities of the commission. There is no law to prevent retaliation against a member of the industry because he "has filed charges or given testimony" against the commission.

The best we can do is watchfully expect no activities smacking of reprisals or coercion. For future protection, every effort should be bent toward seeing that that Natural Gas Act should contain a clause protecting those who give testimony in opposition to the theories and policies of the commission.

THE OIL MAN'S CALENDAR

APRIL 7–10	National Association of Corrosion Engineers, Annual Convention Chicago, Palmer House.
7	Annual Meeting Texas Producers and Royalty Owners' Association Dallas, Adolphus Hotel.
15	National Petroleum Council, Washington, D. C.
16–18	Southern Gas Association, Biloxi, Miss.
16–18	Eastern District, API Division of Production, Spring Meeting, Pittsburgh, William Penn Hotel.
16–18	National Petroleum Association, Semi-Annual Meeting, Cleveland, Ohio, Hotel Cleveland.
22	National Petroleum Council, Washington, D. C.
23–25	Natural Gasoline Association of America, Annual Convention, Dallas, Baker Hotel.
24–26	Interstate Oil Compact Commission, Quarterly Meet, Birmingham, Ala. Tutwiler Hotel.
30-May 1 & 2	American Gas Association, Natural Gas Division, Spring Meeting, Chicago, Stevens Hotel.
MAY 4– 7	Annual Membership Meeting, Petroleum Equipment Suppliers Association, San Francisco, Mark Hopkins Hotel.
6– 8	Petroleum Industry Electrical Association and Petroleum Electrical Supply Association, Joint Convention, Houston, Rice Hotel.
6– 8	Annual Gas Measurement Short Course, Norman, Oklahoma.
8– 9	Mid-Year Meeting of Directors, Independent Petroleum Association of America, Jackson, Miss.
15–16	Pacific Coast District, API Division of Production, Spring Meeting, Los Angeles, Biltmore Hotel.
15–17	National Oil Scouts and Landmen's Association Annual Meeting, Roosevelt Hotel, New Orleans.
21–24	ASME Oil and Gas Power Division, Cleveland, Ohio.
22–23	Mid-Continent District, API Division of Production, Spring Meeting, Amarillo, Texas, Herring Hotel.
27–30	Texas A. & I. College, Second Annual Course in Gas Technology. Kingsville.
JUNE 5– 6	Pennsylvania Grade Crude Oil Association Annual Meeting, Pittsburgh, William Penn Hotel.
16–19	ASME Semi-Annual Meet, Chicago, Stevens Hotel.

Nomads Chapter monthly meetings: LOS ANGELES, second Wednesday, Mayfair Hotel. HOUSTON, second Monday, Ye Olde College Inn. NEW York, first Monday, Louis Sherry's. TULSA, third Wednesday, Hotel Tulsa. DALLAS, date not yet fixed.

New Developments in Diamond Coring

By R. W. STUART, Stanolind Oil & Gas Co., Fort Worth.

The technique of diamond coring has progressed in oil-well drilling to the point that diamond core bits are being used in the regular drilling program in several areas. In penetrating the hard, fine-grained Weber sand of the Rangely field, for instance, footages up to 500 were obtained with a 6⅛-inch diamond core bit on a 50-foot core barrel. Oil-base mud was used as circulating medium.

Improvements in diamond bits have evolved through progressive manufacturing methods and careful study of troubles encountered while drilling. Setting up a standard operating procedure for the diamond core bits in a particular formation after initial runs have indicated most favorable operating factors not only presents a standard for comparison of penetration rates across the field, but also enables conditions to be changed until the best procedure is established.

The development of diamond coring in certain fields has resulted in: 1) increased drilling speeds through difficult formations; 2) reduced drilling costs; 3) 100 percent core recovery and, 4), better completions through accurate formational interpretation.

Inventory of Gas-Drive Operations in North Texas, West Texas and New Mexico

By L. F. PETERSON, Stanolind Oil & Gas Company, Tulsa, and LEE FLOOD, Goldsmith Pool Engineering Committee, Midland, Texas.

Covering the North Texas area in the first part of this comprehensive report, and the West Texas-New Mexico area in the second, the paper affords a complete and up-to-date inventory of each of the 214 individual projects in the area covered by the Railroad Commission Districts 7, 9 and 10, and presents a brief discussion of three of the larger projects.

The data presented on each field include producing depth; type of structure; wells, both producing and input; production, broken down into crude and water; and injection pressures and volumes. The figures not only show the extent of gas-drive operations, but also provide parallels for evaluating areas as yet not being worked for secondary recovery.

Inasmuch as the West Texas-New Mexico section of the API Standing Subcommittee on Secondary Recovery Methods was formally organized only the last January 1, lack of time has prevented accumulation of detailed data such as those presented for the North Texas area. The inventory did, however, cover fields where existing installations are in operation, and listed those where such secondary recovery is planned, with present status of each.

Beach Drilling Talked

The California State Park Commission last week voted to investigate possibility of drilling for oil on Los Angeles County beaches. Revenues would be used to maintain beach parks. Pumping equipment could be countersunk and completely hidden from view, it was pointed out.

AAPG, SEPM, SEG Meet

Geological Trend Discussed at Joint Convention in Los Angeles

By GILBERT WILSON
Staff Writer

PRACTICAL information to be gained from studies of sedimentation in narrow basins; submarine geology off the coast of Southern California; problems encountered in areas of major overthrusting; and a growing interest in exploration and oil possibilities in lands lying within and bordering the Pacific Ocean area were but a few of the major topics discussed at the joint annual meetings of the American Association of Petroleum Geologists, Society of Economic Paleontologists and Mineralogists and Society of Exploration Geophysicists, which were held last week in Los Angeles.

Pacific Areas Studied

Continued advancement of the geologist's knowledge of the origin and accumulation of oil by study of the conditions, both physical and paleontological, under which oil bearing sediments were laid down and reservoirs created, keynoted the general trend of discussion at the opening sessions. Detailed studies of the several narrow basins in Southern California, and descriptions of submarine valleys and fault scarps off the coast were discussed.

A number of authors presented papers dealing with the geology and structural trends in lands lying within and bordering the Pacific Ocean, and revealed the extent to which the oil industry has become interested in these foreign areas. China, Japan, Philippine Islands, Dutch East Indies, as well as countries or geologic provinces bordering the Pacific between South America and Alaska, were subjects of considerable interest. Descriptions of significant domestic fields, and a symposium dealing with petroleum prospecting in overthrust areas of Canada, Wyoming and California, also were included.

Three technical sessions of the SEPM were held. Papers featured descriptions of California stratigraphy and micropaleontology, with emphasis on the classification of rock strata encountered in the state's principal oil provinces; general talks dealing with Foraminifera and other micro-organisms used in the correlation of sedimentary beds in the United States and foreign lands; and a consideration of the origin and environment of shales, sandstones and conglomerates as they relate to the exploration for oil.

Gains in Geophysics

At the SEC technical sessions some 50 papers were presented or read by title. They covered the rapid strides made by the industry in developing the use of the seismograph, gravity meter, magnetometer and the operation of some of the apparatus under water. Included in the discussions were such up-to-the-minute topics as use of the airborne magnetometer, surveying with radar, radioactivity prospecting apparatus and geochemical studies. One author, in comparing the art of seismic exploration with the advances made in the science of X-rays or radio communications, predicted that great advances in seismic work will be seen shortly. A particularly interesting paper, in describing the effects of the Bikini atom bomb test, revealed that a partial answer had been obtained on the age-old riddle as to the make-up of the typical Pacific atoll.

Following the technical sessions, field trips were arranged for visits to La Brea Fossil Pits, the Los Angeles Museum, and the seismological laboratory at California Institute of Technology at Pasadena. For the traditional three-day geological field trip, oilfields and geological features were visited in various Los Angeles Basin, Coastal, and San Joaquin Valley areas.

Honorary Awards Made

Four awards and honorary memberships were presented at the joint session of the three groups. Alexander Deussen, consulting geologist, Houston, received the Sidney Powers Memorial Medal Award of the AAPG. This honor, bestowed "in recognition of distinguished and outstanding contributions to, or achievements in, petroleum geology," recognizes the work which Deussen performed in pioneering new methods and instruments used in oil exploration. Association President Earl B. Noble made the presentation, while Wallace E. Pratt, formerly director of the Standard Oil Company (New Jersey), and a recipient of the award in 1945, delivered a biographical appreciation of Deussen.

Dr. Robert F. Walters, geologist with Gulf Oil Corporation, Tulsa, was given the AAPG President's Award. The prize, a check for $100 and a citation, was in recognition of his recently published paper, "Pre-Cambrian Hills in Northwestern Barton County, Kansas."

Dr. William H. Twenhofel of Madison, Wisconsin, and Dr. Frederic H. Lahee, Sun Oil Company, Dallas, were elevated to the rank of honorary membership in the AAPG in recognition of "distinguished service to the cause of petroleum geology."

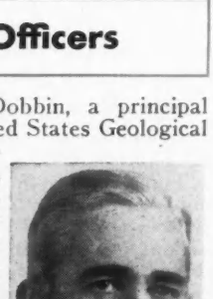
Geological Masks

"Geological Masks and Prejudices" was the theme of an address presented at the joint session by Earl B. Noble, retiring president of the AAPG. In comparing the status of geological knowledge of today with that of 10 years ago, Noble cited numerous instances of fields that were found in areas which previously had been condemned as having slight oil producing possibilities. Among the most commonly recognized geological masks considered by today's geologist as covering potentially great oil bearing structures or provinces are 1) areas of great overthrusting, such as the Lewis overthrust area in northwestern Montana which covers some 4000 square miles; 2) sheets

Earl B. Noble

AAPG Officers

Dr. Carroll E. Dobbin, a principal geologist in the United States Geological Survey with headquarters in Denver, has been elected president of the American Association of Petroleum Geologists. Dr. Dobbin, since 1918, a geologist with the USGS, has specialized in the geology of petroleum and coal in western states and is an outstanding authority on geology of the Rocky Mountain region. He is the author of numerous USGS bulletins and maps, and his writings have appeared frequently in leading technical journals. In assuming the presidency of the association, Dr. Dobbin succeeds Earl B. Noble, manager of exploration for Union Oil Company, Los Angeles.



Dr. Carroll Dobbin

George S. Buchanan, Sohio Petroleum Company, Houston, succeeds D. Perry Olcott, Humble Oil & Refining Company, Houston, as vice president. J. V. Howell, consulting geologist, Tulsa, was elected secretary-treasurer succeeding Edward A. Koester, Wichita, and Clarence L. Moody, Ohio Oil Company, Shreveport, La., succeeds Gayle Scott, Fort Worth, as editor of the associations monthly *Bulletin*.

SEG Officers

Cecil H. Green, Geophysical Service, Incorporated, Dallas, was elected president of the Society of Exploration Geophysicists at the annual meeting held last week in Los Angeles. He succeeds J. J. Jakosky, University of Southern California, Los Angeles.

Cecil H. Green

L. L. Nettleton, Gravity Meter Exploration Company, Houston, was elected vice president to succeed Green. T. A. Manhart, Seismograph Service Corporation, Tulsa, was elected secretary-treasurer, succeeding George E. Wagoner, The Carter Oil Company, Tulsa.

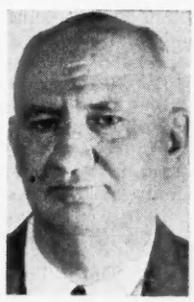
of volcanics which overlie sediments, such as the Columbia River basalts in eastern Oregon and Washington; 3) flat-lying, high velocity limestones which hinder full usage of seismic instruments; 4) thick sands and glacial till; 5) unconformities; and 6) water. In the last category, great hope is held for developing new reserves through development of under-water prospecting devices.

Human prejudices greatly influence the development of new areas. Noble recounted the example of Kettleman Hills, which, prior to the development of oil on this structure, had been regarded with pessimism by oil geologists. It was thought that the reservoir was too large to contain oil; the depth involved, 8000 to 10,000 feet, precluded the existence of crude oil, but that if it did contain oil, the sands would be too tight. A geologist either carries prejudice from one area to another, or he may enter a new area with no pre-conceived ideas. Both extremes must be tempered in the light of present day knowledge. The problem of just how many holes it takes to write off an area, was given as an example of the type of decision confronting today's geologist.

Noble concluded with the plea that all showings, no matter how small, be given exhaustive tests before a hole is abandoned; that older areas be reworked in the light of more recent geological knowledge. These policies must be carried out diligently if we are to find the two billion barrels a year of new crude oil reserves, the amount considered to be a minimum for supplying present and future needs.

Ancient Gulf of Mexico

Environmental conditions and sources of sediments in the ancient Gulf of Mexico, a study which greatly aids the Gulf Coast geologist, was the subject of an address by F. W. Rolshausen, retiring president of SEPM. Over a period of some 27 years, samples have been taken from many wells and outcrops in the area surrounding the Gulf of Mexico. The study reveals that the deposits of any one formation have a highly variable composition from the Rio Grande to Florida. In general, the Gulf Coastal region can be divided into five major areas of deposition. Deposits are gradational between areas and boundaries are indefinite. These areas are 1) South Florida; 2) North Florida, South Georgia and Southern Alabama; 3) Mississippi Embayment; 4) East Texas Basin; and 5) Rio Grande Embayment. Contemporaneous deposits of fossiliferous and non-fossiliferous sands and shales, red beds, chalks, limestone, dolomites, anhydrite and salt, to a large extent seem to have been dependent on the amount of rainfall on the land areas surrounding the ancient Gulf of Mexico. West of the Appalachian Mountains, during Lower Cretaceous and up to and including Eagle Ford times, the major source of sediments seems to be from rivers entering the Gulf from the north and northeast, and from the northwest and west on the east side of these mountains. After Eagle Ford times, the major source of sediments was from rivers entering the Gulf from the west. These rivers probably drained the major portion of the western part of the present Mississippi River basin. There is evidence that an ancient Rio Grande was the major source of sediments during the late Upper Cretaceous, Eocene, Oligocene and Lower Miocene, and that the Mississippi River contributed very little to the sediments of the Gulf region until late Upper Miocene times.



F. W. Rolshausen

SEPM Officers

Election of James A. Waters, Sun Oil Company, Dallas, as president of the Society of Economic Paleontologists and Mineralogists was announced during the annual meeting last week. Retiring president is F. W. Rolshausen, Humble Oil & Refining Company, Houston.

Incoming vice president is W. C. Krumbein, Geological Department, Northwestern University, Evanston, Ill., who succeeds Cecil G. Lalicker, University of Oklahoma. H. B. Stenzel, Bureau of Economic Geology, University of Texas, was re-elected secretary-treasurer.

Incentives to Exploration

Political interferences in the United States Patent Office and faults in the present income tax laws, were cited by J. J. Jakosky, retiring SEG president as being two of the most important factors presently holding back the development of new exploration techniques, which, in turn, affect the rate of discovery of new fields. Even a small improvement in instrumentation may spell the difference between properly or improperly interpreting a bit of evidence which might lead to the discovery of a new field. Publication and dissemination of new ideas within the industry which deal with equipment and techniques, frequently are delayed for long periods of time, solely because the company which has discovered an idea cannot afford to run the risks and uncertainties encountered in the Patent Office.

J. J. Jakosky

The income tax structure should be revised, according to Jakosky, so as to permit and encourage the long-range type of financing needed in developing exploratory projects. Recent crude price increases will spur additional exploratory work, but this will not be enough to keep up the high rate of exploration that is required.

MacArthur Aide Speaks

Reflecting the importance which General Douglas MacArthur attaches to the matter of petroleum reserves in the Pacific areas, was the arrival by plane of Leo W. Stach, Australian geologist who heads the petroleum branch of the natural resources section of the Supreme Command Allied Powers in Tokyo. As General MacArthur's personal representative, Stach outlined SCAP's efforts to create an economically sound oil program for the conquered Japanese empire, using the resources in the home islands. He pointed out that the best oil fields in the Northern Pacific area lie in the Sakhalin Islands, now occupied by Soviet forces.

Research Committee Projects

The subject of sedimentology, broken down into subdivisions that are indexed and rated according to relative importance and urgency, was the principal consideration of the Research Committee under the direction of Dr. Shepard W. Lowman, Shell Oil Company, Incorporated, Houston. Assigned to the various project sub-committees were the following eight principal topics: clay and clay minerals; carbonate reservoirs and their characteristics; formation waters; cementation of sediments; role of bacteria; and role of organic material in sedimentation, the latter subject being divided into two sub-divisions, recent and ancient. The reports were approved as read and recommended to the executive committee as a program. It was recommended further that the executive committee approve it as an official program of the association and that it be submitted to the American Petroleum Institute for consideration.

Texas Anti-Flare Order Applied to 15 More Areas

The Texas Railroad Commission last week ordered operators to show cause why 15 more fields should not be closed in unless the large quantities of gas now flared are diverted to legal use. Operators in Heyser, Tom O'Connor and West Ranch will be heard on April 8. Anahuac, Conroe, North Withers, Magnet Withers and Webster will be considered April 9, Agua Dulce on April 10, North Cowden, Goldsmith, McElroy, Slaughter and Wasson on April 11, and K.M.A. on April 15.

Commission Chairman Ernest O. Thompson reminded that "more than a year ago we warned refiners and operators that there was then a billion cubic feet of casinghead gas being flared daily and that we were intent on seeing it utilized. . . .

"The time will come, and sooner than you think when an oil well will not be allowed to go on production schedule until the operator has established and set up a lawful way to utilize the gas which is produced with and as an incident to the production of that barrel of oil. . . . Certainly we must undertake to prevent avoidable waste of gas where great quantities of it are needlessly blown to the air when it is economically feasible to utilize it, thus preventing avoidable physical waste as required by Texas law."

The commission's anti-gas waste order, effective April 1, for the Seeligson field, Jim Wells and Kleberg counties, is under attack in court, a petition of numerous field operators for a temporary restraining order being set for hearing today in the 126th District Court.

Mississippi Line Finished

The 85-mile 6-inch natural gas pipe line of United Gas Pipe Line Company from its Jackson, Miss., compressor station to Philadelphia, Miss., has been completed. The new line will serve nine towns in the east-central section of the state.

Unconformities to Play Major Role In Arkansas-North Louisiana Discoveries

Part 1

Truncation Around the Monroe Uplift

By MICHEL T. HALBOUTY and GEORGE C. HARDIN, JR.

OIL has been produced for many years from traps associated with nonconformities, particularly in the Mid-Continent region. However, at the time of the discovery of the prolific East Texas oil field in 1930, little was known about stratigraphic traps of this type and the search for new oil fields was conducted largely on the basis of the anticlinal theory. When sufficient exploration had been completed in the East Texas field to determine the causes of oil accumulation, it was realized that this large field is structurally the result of truncation of the Woodbine-Eagle Ford group of beds followed by overlapping of the Ector tongue of the Austin chalk (Figure 1). This interpretation of the structural and stratigraphic conditions of this largest of U. S. oil fields made petroleum geologists "truncation-conscious," and in the years that followed, considerable effort was expended in the attempt to discover new oil fields of the East Texas type. Most successful of these enterprises in the Upper Mississippi Basin resulted in the discovery of the Delhi field in 1944 and subsequently the associated West Delhi, Big Creek, Southwest Delhi, South Big Creek, and Lamar fields in Richland, Madison, and Franklin parishes, Louisiana (Figure 2). The limits of Delhi production have not been established to date and the producing area is being extended east and west.

Both the East Texas and Delhi fields are the result of nonconformities—truncation and overlap — in areas that afford lateral closure. The North Louisiana-South Arkansas area contains many potential stratigraphic traps and the writers feel safe in predicting that several new oil fields of the East Texas and Delhi type will be discovered in this region within the next decade.

The Delhi Oil Field Area

Truncation of Tuscaloosa and Paluxy sands around the south flank of the Monroe Uplift followed by overlapping of the Clayton gas rock and the Midway shales form the trap for oil accumulation in the Delhi and associated fields. The structural conditions here are very similar to those existing on the west flank of the Sabine Uplift, where lies the East Texas field (Figure 3). However, uplift prior to truncation and the amount of truncation is much greater around the Monroe Uplift than around the Sabine Uplift (Figure 4).

Seismograph work in the Monroe Uplift area led to the drilling of the discovery well of the Delhi field—The J. E. Holt 1—by C. H. Murphy, Jr., and Sun Oil Company. This well was drilled to 3425 feet and was completed from perforations between 3273-91 feet. Initial production was 218 barrels of 38-gravity oil through 12/64-inch tubing choke. Completion of the first well as a producer naturally led many to believe that the discovery was located on an anticlinal structure located by geophysics. The usual local lease plays followed as close to the well as possible and resulted in other wells being drilled in several directions from the discovery well.

The completion of the first few wells furnished sufficient geological and stratigraphic information to change the geological interpretation as to the type of oil trap. It was found that structure played but a small part in the oil accumulation and it was then realized that an important discovery had been made that looked like a "small East Texas." Heavy leasing along the strike of the discovery well followed this new interpretation and appreciable extensions were made to the Delhi discovery. As a result of these extensions, every available rig in North Louisiana was pressed into service and an intensive drilling campaign followed which resulted in the discovery of the West Delhi field, an extension of the Delhi field, and the Big Creek field. Principal production from the Delhi and West Delhi field is from a basal tuscaloosa sand and from the underlying truncated Paluxy sands (Figure 3).

These two fields have been proven to constitute one continuous reservoir. The Big Creek field produces from lenticular sands occurring higher in the Marine Tuscaloosa with the basal sand overlapped and absent. The Big Creek field is not so prolific as the Delhi and West Delhi fields.

The productive area of these three fields is more than 15 miles in a northeast-southwest extent and is approximately two miles wide. To date this producing area has not been definitely defined. Based on available data, the average oil well on a 40-acre tract with an average thickness of sand and suitably located in the Delhi field is estimated to have a value of approximately $1 million. The present estimated recoverable oil reserve in the Delhi and associated fields is in excess of 250 million barrels.

Discovery of this very prolific producing area at the relatively shallow depths of 2900 to 3300 feet has further substantiated the claim of many far-seeing geologists that there is still plenty of oil to be found in the North Louisiana-South Arkansas area above 5000 feet. For this reason, this area is considered one of the most economical areas in the U. S. for independent operation. The extremely high costs of the deep 10,000 to 16,000-foot wells now being drilled in the Gulf Coastal region practically makes such operation prohibitive for the small independents. Since most of the acreage with shallow possibilities in the Coastal region is located on piercement-type salt domes and as this acreage is principally held by leases or owned in fee by the major companies, a large number of independents are looking to the North Louisiana-Arkansas area for a new region in which to conduct the majority of their future operations.

Delhi-Type Field Foreseen

The "pinchout" or truncated edge of the Tuscaloosa and Paluxy sands continues eastward from the Delhi field around the southeast flank of the Monroe Uplift and Sharkey platform into Mississippi (Figure 2). Several wildcats have been drilled along this trend in an effort to establish another stratigraphic producing area; to date, these efforts have met with little success. However, it is the opinion of the writers that another field of the Delhi type will be found somewhere in eastern Madison Parish, Louisiana, or in Sharkey, Issaquena or Washington counties, Mississippi, where structural conditions, or the lenticularity of the sands, affords sufficient lateral closure.

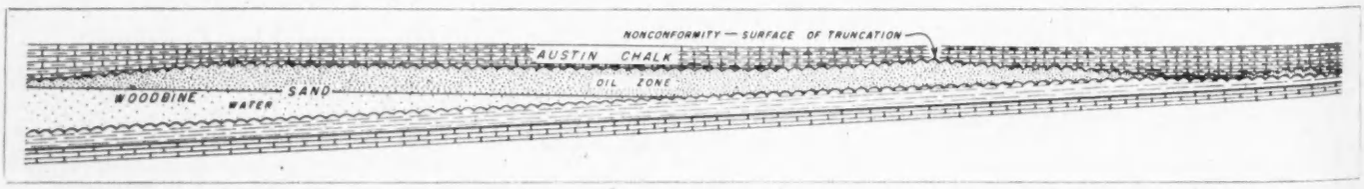


Figure 1. Generalized east-west cross section through the East Texas Field showing relation of accumulation to nonconformity.

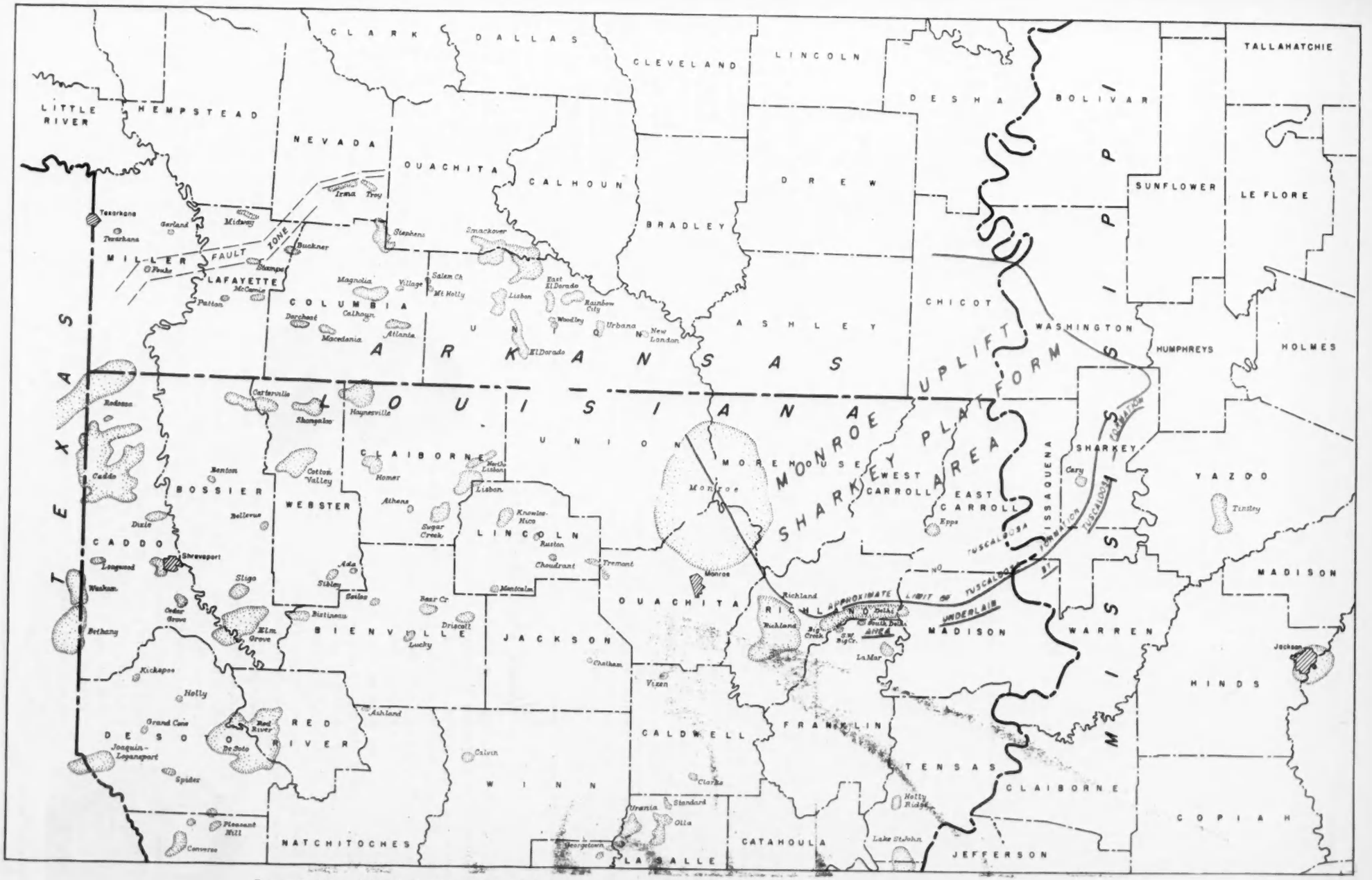
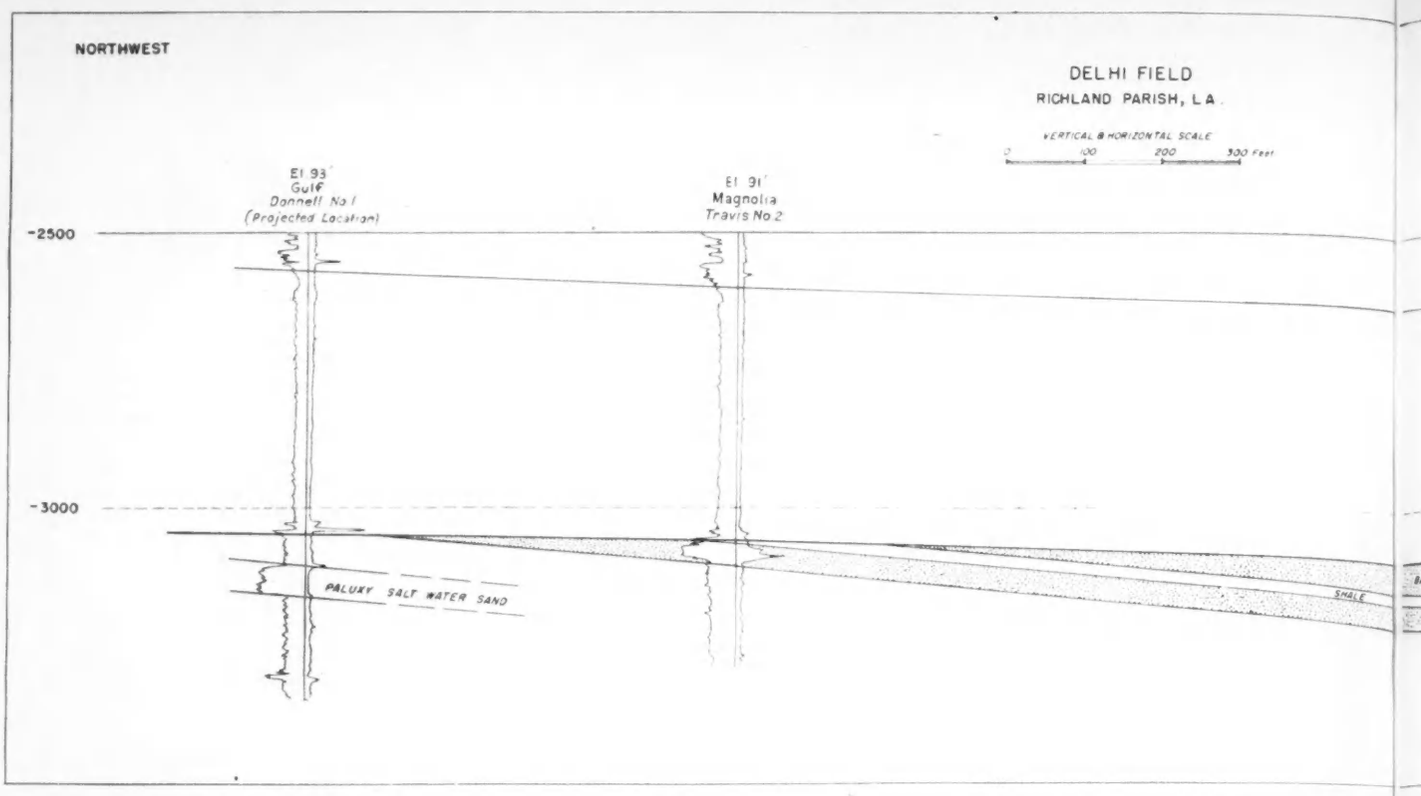


Figure 2. Map of North Louisiana-South Arkansas area showing approximate line of Tuscaloosa truncation around the Monroe Uplift.



In the Monroe Uplift-Sharkey platform area, it is known that the entire southeastward dipping section from the base of the Annona Chalk down through the Travis Peak formation and into the top of the Cotton Valley formation has been truncated (Figure 4). There has been considerable leasing in this area and several wildcats have been drilled north of the Delhi field in an effort to find production in the truncated Rodessa and Pettit zones of the Lower Glen Rose. To date, none in this northern area has been successful, although the geological information obtained indicate that more wells are warranted in the attempt to find production in these zones.

South of the Delhi, West Delhi and Big Creek fields a number of wildcat wells have been drilled in an effort to find production in overlapped Tuscaloosa and Paluxy sands, in truncated Tuscaloosa sands occurring higher in the section than those producing at Delhi, and in truncated sands of the Tokio and Ozan formations. These wells have resulted in three discoveries—the Southwest Delhi, South Big Creek, and Lamar fields. None of these fields have any appreciable extent at present; the sands in each of these three fields appear to be lenticular so the productive area of each will probably be relatively small.

Although the number of wildcats drilled around the Monroe Uplift in 1947 probably will be less than the number drilled in 1946, the search for new reservoirs in this area will continue. Every wildcat drilled in the area has an excellent chance of finding production in one of the many truncated or overlapped sands. This "multiple sand" feature and with the prospect of large financial rewards from shallow producers drilled at moderate cost have made this area appealing, not only to the independent but to all the major companies operating in North Louisiana. The prospect of finding production similar to that of the Delhi field where a well drilled and completed at a cost of $16,000 to $25,000 and to be worth approximately $1 million has great appeal for both major companies and independent operators.

Truncation on the Southeast Flank Of the Sabine Uplift

The sands of the Woodbine series that form the reservoir for the large East Texas field are not present on the crest of the Sabine Uplift. Sands of basal upper Cretaceous age that are approximate Woodbine equivalents occur on the southeast flank of the Sabine Uplift in Natchitoches, Sabine, Rapides and other parishes of this area. These sands have been truncated and overlapped by subsequent deposition. Somewhere in the zone of truncation of these sands, oil traps undoubtedly exist. The east and southeast flanks of the Sabine Uplift are structurally more complex than the west flank where lies the East Texas field. This structural complexity is one of the factors which probably accounts for the lack of any large fields comparable in size to the East Texas field on the east flank of the uplift, but increases the likelihood that several smaller fields along the truncated edges of these sands may be found.

About the Authors

MICHEL T. Halbouty is a graduate of A. & M. College of Texas, receiving his B. S. degree in geology and petroleum engineering in 1930, and M. S. degree in the same courses in 1931. He was chief geologist and petroleum engineer for the old Yount-Lee Oil Company until 1935 and in a similar capacity with Glenn H. McCarthy from 1935 until 1937, when he entered the consulting field. He served in the army during the war at Fort Benning, Ga., Infantry School, and later as chief of the Petroleum Production Section, Planning Division, in the Army-Navy Petroleum Board. He was released from active duty as a lieutenant colonel in September, 1945.

Michel T. Halbouty

George C. Hardin, Jr.

George C. Hardin, Jr., studied geology and petroleum engineering at A. & M. College of Texas and received his B. S. degree in 1941. He received his M. S. degree in geology from the University of Wisconsin in 1942. After graduation he joined the U. S. Geological Survey and served as party chief in charge of geologic work in connection with fluorspar in Kentucky and Illinois. He left the survey in 1945 to accept the position of geologist and petroleum engineer for the Carter-Gragg Oil Company and held this position until he joined the consulting firm headed by Michel T. Halbouty in February, 1946.

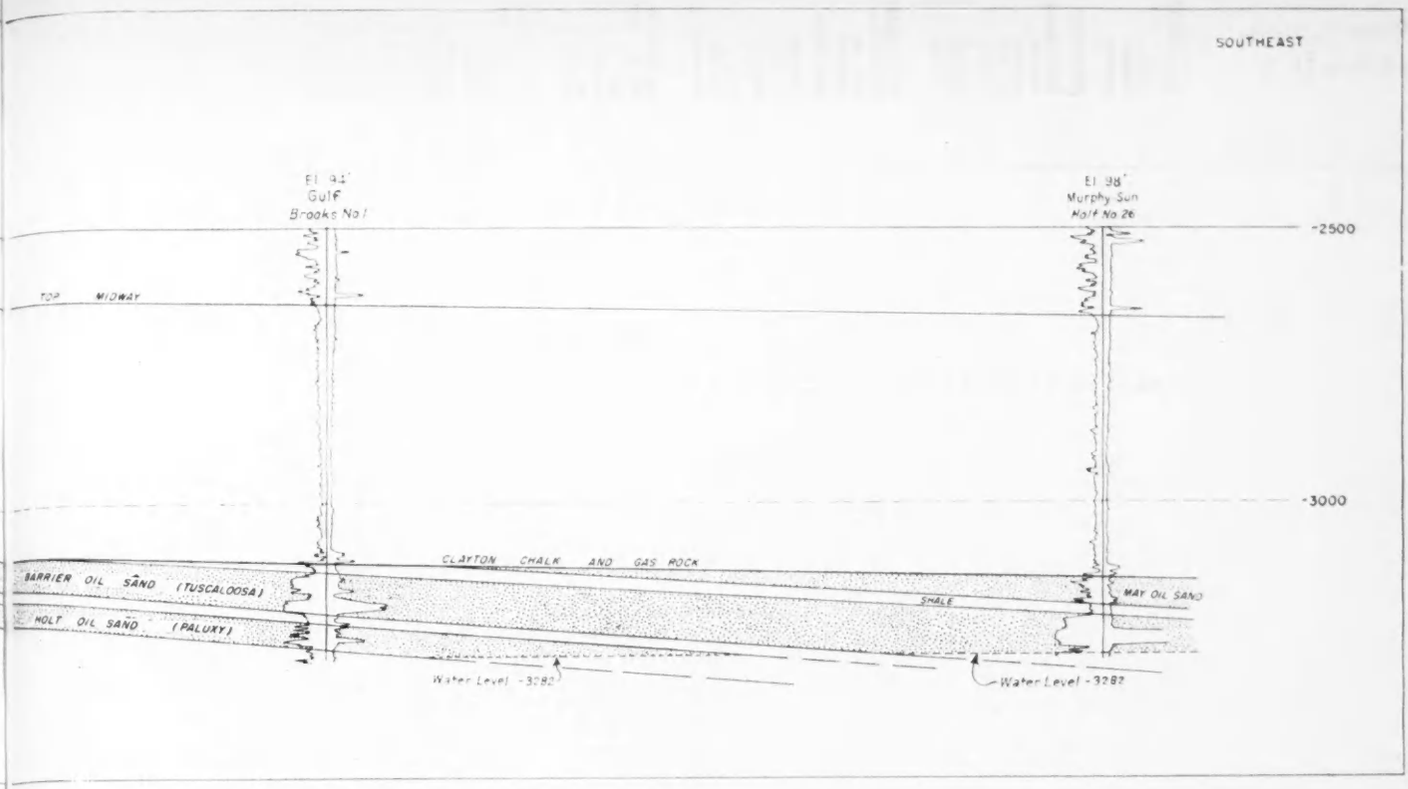


Figure 3. Northwest-Southeast section through Delhi field showing relation of accumulation to non-conformity.

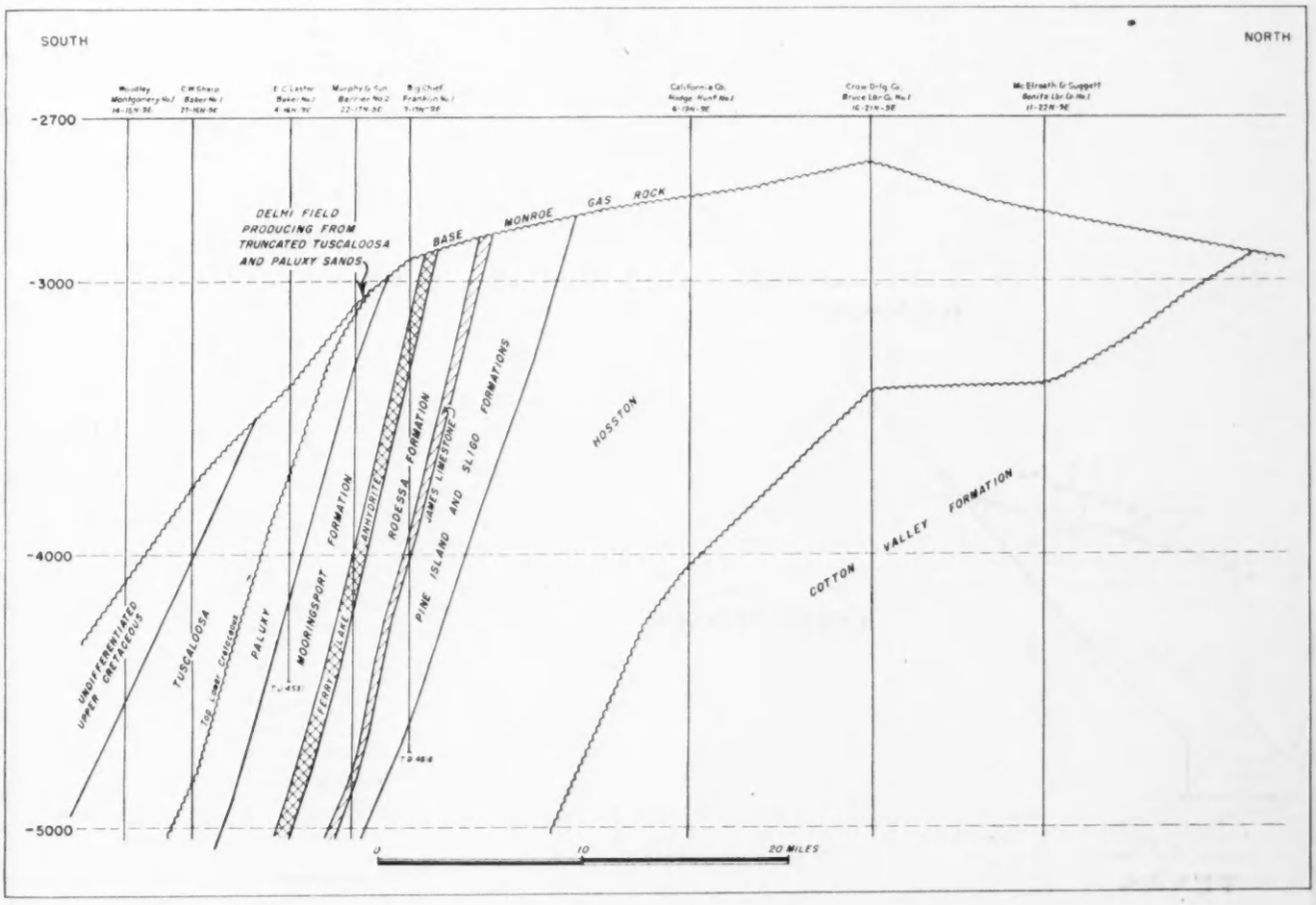
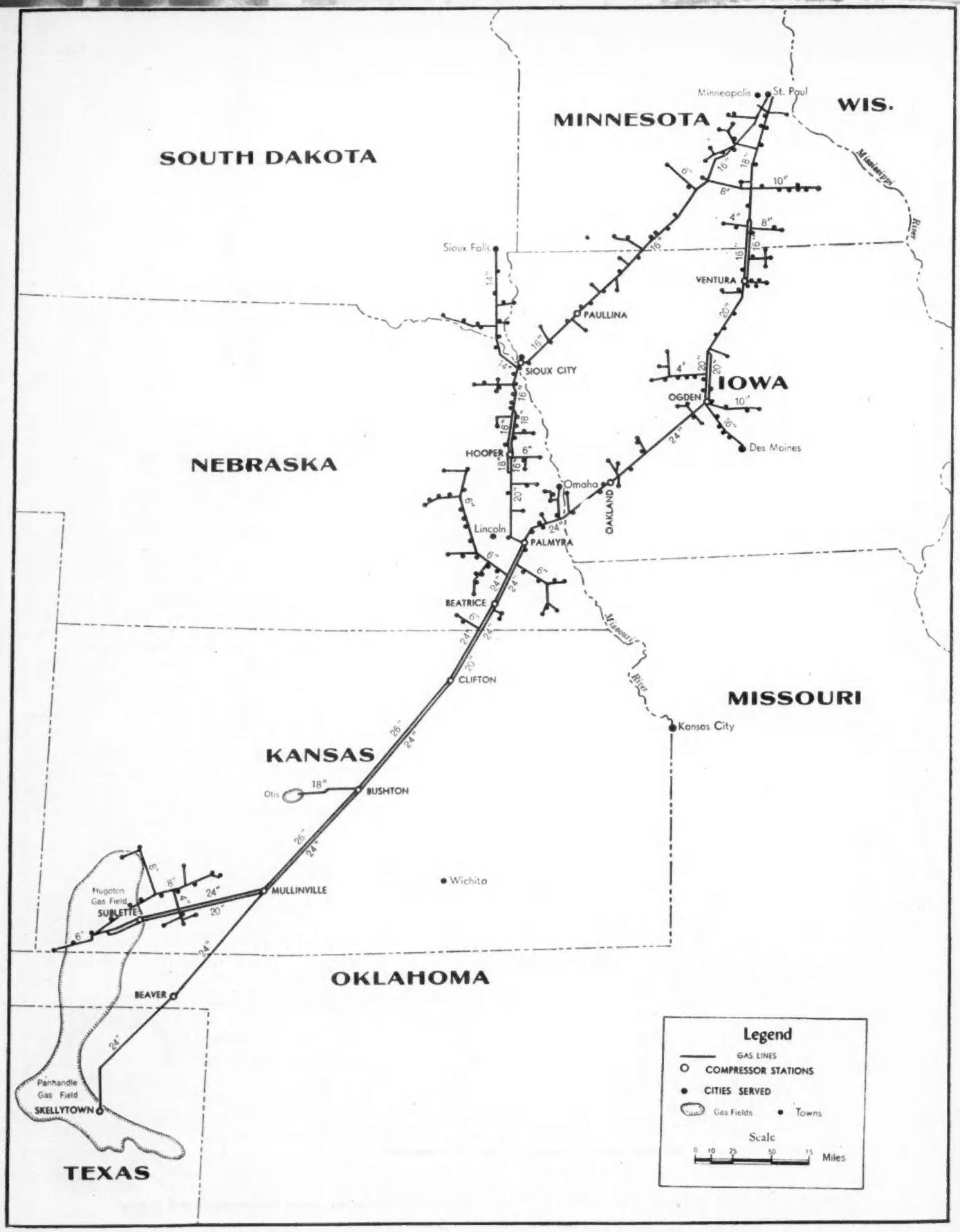


Figure 4. North-South section through southern part of the Monroe Uplift showing extent of truncation and overlap.

Pipe Lines of the U. S.

Northern Natural Gas Company

Eighth of a Series



AN EVALUATION OF

Present-Day Geophysical Exploration

FOR OIL

Part 3

By SYLVAIN J. PIRSON

Laboratory of Applied Geophysics and Geochemistry, State College, Pennsylvania

(b) Combination Stratigraphic and Structural Traps

IN prospecting for combination stratigraphic-structural traps, we are concerned mainly with establishing the existence of truncation or beveling features on the flanks of known or recently discovered sub-surface structures through the application of the proper structural discovery tools to be discussed in the following sections.

Essentially, the problem is that of a judicious application of the previously discussed stratigraphic tools to the areas bordering the extent of the buried structure: granite ridge, compaction folds, salt domes, etc. Complications are, however, introduced by the presence of commonly steeper dips than in the previously discussed applications and by the limited extent of the bands of prospective sands or porous zones surrounding the structure. Faults also are likely to be present, which in no way simplify the problem. In all, the problem is a complex one which in itself must be a matter of considerable research and often of imagination in picturing subsurface conditions. In no way can it be considered a routine job of merely getting data or records on a preassigned pattern and on a production basis. Often the field technique of a method will have to be "tailored" on the spot to the particular problem at hand, which will require considerable resourcefulness on the part of the geophysicist.

Certain structural tools are susceptible of adaptation to the problem of locating flank truncation reservoirs. This is particularly true of the reflection seismograph, although the inference that a truncation exists is obtained from negative information. A truncation may be suspected from the sudden disappearance of a good seismic reflection in profiling an area across regional dip. Other empirical geological relationships may be ascertained also through seismic reflections. It is common knowledge in the Mid-continent region that wherever the Hunton formation thickens there is a good chance for the presence of a porous and presumably productive Bois d'Arc section. The present active seismic search for pools of the West Edmond type on the rims of the Anadarko Basin, Oklahoma, uses this relationship by the construction of isopach maps calculated from the reflection time interval between the Hunton lime reflection and the underlying Viola lime reflection. The shortcomings of such a procedure are immediately apparent as the time delay observed on seismic records might be due to a relatively minor thickening of the low velocity intervening Sylvan shale. This difficulty could be overcome if it were possible to obtain a dependable seismic reflection from the base of the Hunton formation. To the writer's knowledge this is not yet possible.

Summarizing the limitations of reflection seismic rock in delineating subsurface truncation, it may be said that they reside in the inability of the seismic method to obtain measurements from the prospective reservoir rock itself in a manner similar, for instance, to the measurements obtained by deep resistivity logs or the electronic stratigrapher.

Other structural prospecting tools are even less suitable for the prospecting of flank reservoirs, though one might imagine that a highly magnetic sand could be delineated by the magnetometer and a dense reservoir rock by a high precision gravimeter survey. These anomalies would constitute third order anomalies as isolated after elimination of first and second order anomalies due respectively to basement magnetic polarization and density contrast and to structural basement relief. This would require high precision field work and considerable geologic information, conditions rarely fulfilled in practice. This question will be treated more fully in conjunction with structural prospecting.

The magnetometer offers another interesting possibility in connection with the discovery of buried truncations of the Oklahoma City type. Supposing that the truncated structural relief contained a sedimentary layer rich in magnetite, hematite, or, in other words, practically a deposit of iron ore of the sedimentary type such as the Weches and Recklaw formation of East Texas or the Gatesburg formation of Pennsylvania. Through weathering at the time of the unconformity, the magnetic minerals of the iron-bearing formation would be transformed into less magnetic ones such as limonite, hence forming oxidized brown iron ores. A negative magnetic anomaly would thereby result, as well as from the partial removal of the original iron ore formation. Such a possibility is clearly indicated in Figure 6, which illustrates a magnetic profile taken in central Pennsylvania along the 28th Division Highway (U. S. Route 322).

One notes the very good correspondence of the two magnetic highs in the region of Boalsburg with the Penn Valley and Boalsburg (?) anticlines. The magnitude of the magnetic reliefs over these two anticlines is much larger than would be expected from basement relief below; accordingly, they must be attributed to the structural relief of the magnetite-bearing Gatesburg formation (Eg) from which the famous iron ores of Scotia were mined by Carnegie in the middle of the 19th century. Over the Gatesburg anticline, however, which brings the Gatesburg formation to the surface, the magnetic high, which at first reflects closely the anticlinal structure, is abruptly surmounted by a low attributed to the cause mentioned above, namely partial erosion and removal of the magnetite-bearing Gatesburg formation and transformation of the remaining lower section into a relatively non-magnetic bog iron ore.

This relationship may prove useful in the economic interpretation of a magnetic survey of Pennsylvania, now in progress. The Gatesburg formation in fact is a sandy dolomite in its bulk and when weathered it leaves a loose and porous sand which in the eventuality of burial under later sediments would yield an ideal reservoir rock. This eventuality is not devoid of possibilities in the deeper parts of the Appalachian geosyncline and over its northern slopes.

(c) Structural Traps

Of all oil and gas fields, those controlled by simple structural deformations of strata in the absence of truncations and pinch-out are without question the easiest to be discovered geophysically since the problem can be reduced to the simple measurement of depth to key horizons without any particular attention paid to sand or reservoir rock conditions. Indeed, the search for structural relief is much more economically successful than the search for stratigraphic traps because with structural reliefs are often associated oil and gas fields that have multiple and superposed reservoir horizons. In other words, when the existence of a buried structure has been established, the exploratory well has not only one chance of finding production but multiple chances equal in number to those of the various potential reser-

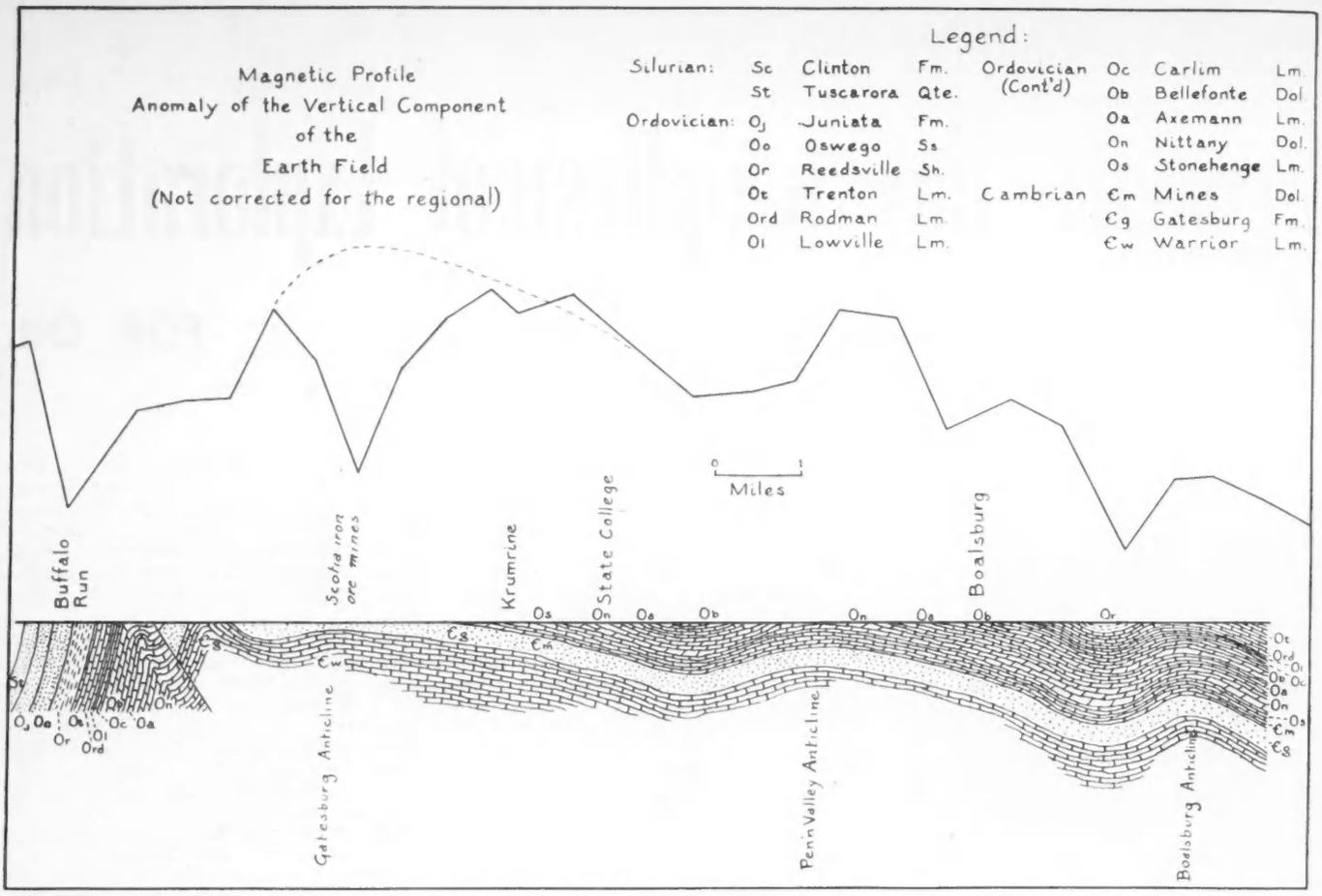


Figure 6. Magnetic profiles in Central Pennsylvania illustrating negative magnetic anomalies over the partially eroded and weathered magnetic Gatesburg formation.

voir rocks deformed by the buried structure. To mention a few outstanding cases, the following structural multiple sand fields are listed: Long Beach and Ventura, California; Tonkawa and Cushing, Oklahoma; Eldorado, Kansas; Louden and Salem, Illinois; etc.

On the contrary, stratigraphic traps and more particularly those of the structural flank type offer but single-shot chances with the attendant greater risks.

Geophysical measurements from the surface in structural prospecting are the best known and need little comment. They may be listed in order of decreasing popularity as follows:

Seismic reflection and refraction surveys,
Gravimetric and torsion balance surveys,
Magnetic surveys,
Electric surveys,
Geothermal surveys.

They may be divided into three groups:

1. Those methods making use of an action at a distance which involves some form of *radiating energy.*

2. Those methods making use of the *distortion* introduced in a *natural field of force* by the interposition of a favorable structure and trap containing oil or not.

3. Those methods making use of the distortion introduced in an *artificial or applied field of force.*

Radiant Energy Methods

Radiant energy may take the following forms:

1. Electromagnetic radiations:
   - Radio waves
   - Infra-red rays
   - Visible light
   - Ultraviolet, X, γ and cosmic rays
2. Particle radiations:
   - α, β rays
   - Protons, neutrons, etc.
3. Mechanical vibrations:
   - Ultrasonic
   - Acoustic
   - Seismic

Of the various forms of radiant energy, very few may be harnessed to solve the problem at hand, namely, that of measuring the depth to one or more significant geological discontinuities. The electromagnetic radiations are almost completely ruled out. Though one might hope to receive some reflected electromagnetic energy from a dielectric and/or resistivity discontinuity within the earth, the absorption of the radiant energy by near surface beds precludes the observation of deep effects. Some unsuccessful attempts have been made at measuring the areal field intensity distribution of a sending radio station (also commercial broadcasting stations) and to correlate the field intensity map with sub-surface geologic features. The idea has even been carried out to the point where the field intensity measurements appear on the viewing screen of a cathode ray oscilloscope installed in a truck to observe directly the intensity variations as the receiving instruments are carried over the area prospected. The observer was to note on a map the various highs and lows and even interpret them on the run. Radio waves, except those of very long wave length, offer little if any possibility as a structural tool. No revolutionary method is expected from wartime radar development even with the use of the directional properties characteristic of extreme short waves.

The only electrical methods which have possibilities are those which are limitation cases of electromagnetic radiations where the frequency is lowered to very low values or even to zero (D.C.). These cases which have been discussed previously under resistivity methods are, to a certain extent, suitable to the determination of sub-surface structures, but the depth measurements obtained are greatly lacking in precision to make them valuable structural tools.

Surface exploration by means of particle radiation has been successful only in prospecting for faults covered by a thin overburden. The measurement of α and β radiations from the radon gas contained in soil air samples has proved of some value.

Of all the methods making use of radiant energy, the seismic methods are the best known and the most useful. Since their field of application as well as limitations have already been commented upon, but a cursory discussion will be made at this point. The seismic methods may be classified as follows:

(a) Refraction

(b) Reflection:
Correlation method.
- Spot shooting
- Continuous profiling

Correlation-dip method
Clinometer or dip shooting method

(c) Multiple events
refraction shooting

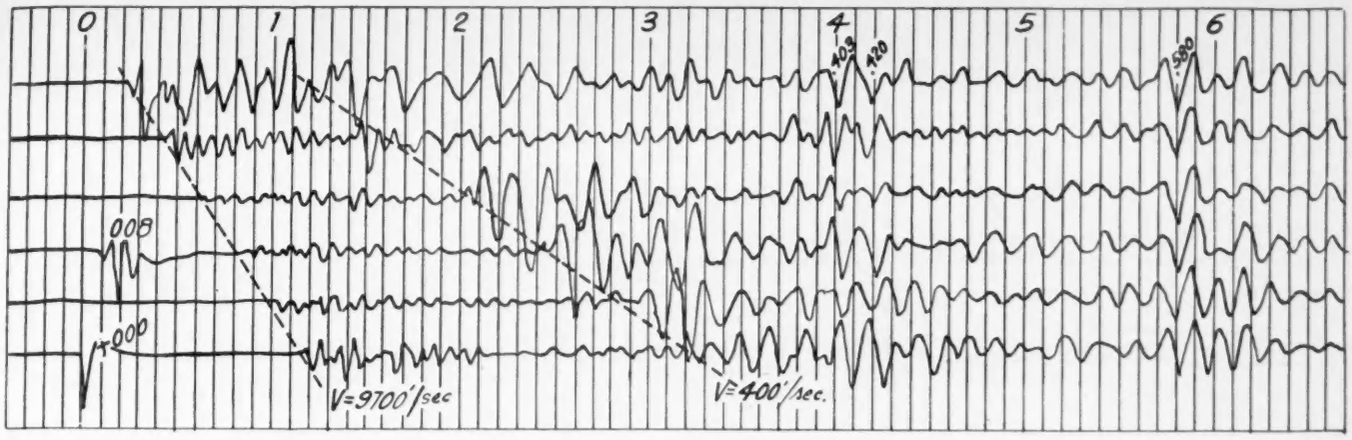


Figure 7. An early multiple events seismic record showing the arrival of two refracted waves of velocities 9700 and 4000 feet per second as well as prominent reflected waves.

The high days of refraction work occurred during the period 1924-1930 when prospecting for relatively shallow salt intrusions was at its peak. Discovering salt domes by "time leads" in "fan shooting" or "cross fanning" was as simple as picking up eggs from a basket on Easter morning. This practice was of short duration and great refinements became necessary in order to make refraction shooting a valuable oil prospecting tool. Its usefulness is presently confined mostly to areas where reflection shooting is impossible, such as where a hard, high velocity formation is close to the surface (Edwards Plateau, southwest Texas, Florida, etc.) or where good reflecting horizons are almost totally absent (southeast Colorado). Some worthy field methods have been devised for such cases by Gardner[23], Jones[24] and others.

In correlation-reflection shooting, which is at its best in areas of blanket-like formations, the spot shooting method has almost completely disappeared in favor of continuous profiling[25], though this improved process has not completely eliminated the main shortcoming of reflection-correlation work, namely jumping stratigraphic horizons through instrumentally produced phase change patterns. A further shortcoming is the uncertainty attending the recognition of faults except in exceptionally favorable cases.

In areas where geologic formations lack continuity and are lenticular or cross-bedded, the reflection seismograph may be used as a sub-surface clinometer through the practice of dip-shooting. The determination of formation dips from reflection "step-out times" lacks greatly in precision and only high closure sub-surface structures may be determined successfully by this method. In extremely high dip formation, even dip-shooting loses its value due to the reflection point's horizontal shift or "side-swipe."

A method called the correlation-dip method was devised by the writer in the summer of 1937 for shooting steeply dipping formations[26]. This method eliminates the danger of miscorrelation of the records shot from the same shot point. This difficulty was up to the date of its introduction one of the main pitfalls in calculating depth of a reflecting horizon from three seismic reflection profiles shot from the same shot point but in three different directions.

Recently a new field procedure has been reported in the literature and has been used extensively in the last few years, namely the multiple refraction method[27].

The writer probably was one of the first to observe the phenomenon upon which this method is based, as evidenced by the reproduction on Figure 7 of a normal seismic record obtained by continuous profiling in the region of Beggs, Okla., in the fall of 1935. One may note the arrival of a wave front, between .1 and .3 second, which has the apparent velocity of about 4000 feet per second following the first breaks, which arrivals show an apparent velocity of 9700 feet per second. Evidently, the later arrivals after first breaks are from a low velocity layer below the weathered zone. Although the phenomenon was found of interest at the time to warrant a study of its possible uses, the length of geophone spread was too short to observe a similar phenomenon at greater and more useful depths. Facilities to experiment with longer spreads were not available and accordingly the usefulness of the later refraction arrivals was not rediscovered until some ten years later.

One may distinguish two types of field practices in multiple refraction shooting, namely:

(a) Spot correlation refraction shooting

(b) Multiple events continuous refraction profiling[27]

1. In-line shooting
2. Broadside shooting
3. Arc shooting

In the first instance the refracted bed is identified by its refraction velocity and its sub-surface changes in elevation are calculated (after application of surface elevation, weathering and datum plane corrections) as deviations from normal stepout time for a horizontal refractor. The usual correlation difficulties from profile to profile are attendant on this type of field operation, particularly the jumping of one complete cycle of the recorded event.

The continuous-profiling technique eliminates this danger to a large extent. The multiple-refraction technique appears as a suitable tool not only to map the relief of refracting sedimentary beds below a cover of thick limestones but also to delineate basement structures. It is known that the reflection seismograph is generally unable to determine the igneous-sedimentary contact due to the lack of sharpness in the boundary: an old surface of weathering is a poor discontinuity from which to expect reflected seismic energy to be received in a consistent manner. Accordingly, the new technique may prove a valuable help in solving problems of deep tectonics associated with basement relief, problems in which, to this date, the ambiguity of the interpretation of magnetic and gravimetric maps has been a considerable handicap.

With the war developments in acoustics and ultrasonics, the expectancy of revolutionary developments based on the directional properties of short vibrational waves has been expressed on occasion. The radiating energy at high frequency is too easily absorbed to obtain the desirable penetration in the earth. Even with the focusing of energy which short sonic waves provide, it is not expected that penetration in the earth will be materially increased.

2. Distortion Methods of a Natural Field of the Earth

The natural physical fields of the earth susceptible to be distorted by the presence of a favorable oil and gas structure are the following:

1. Gravitational field
2. Magnetic field
3. Electric field (telluric method)
4. Thermal field

Gravitational Methods

It is common knowledge that if the earth were a perfect homogeneous sphere at rest, the force or acceleration of gravity would be constant over its surface. However, the earth is not a perfect sphere, it is not homogeneous, and it rotates. Any gravity deviation from that due to a perfect sphere at rest may be termed an anomaly. However, in prospecting for geologic structure we are solely interested in the anomalies or distortions introduced in the earth's gravitational field by geological masses structurally significant. To this end we eliminate as corrections the anomalies due to rotation, earth flattening, altitude, topography and whatever instrumental drift there may be.

The residual values so obtained constitute geological gravitational anomalies. The residual picture is the combined effect of superimposed or juxtaposed geological features. Depending on their respective depth and extent, the

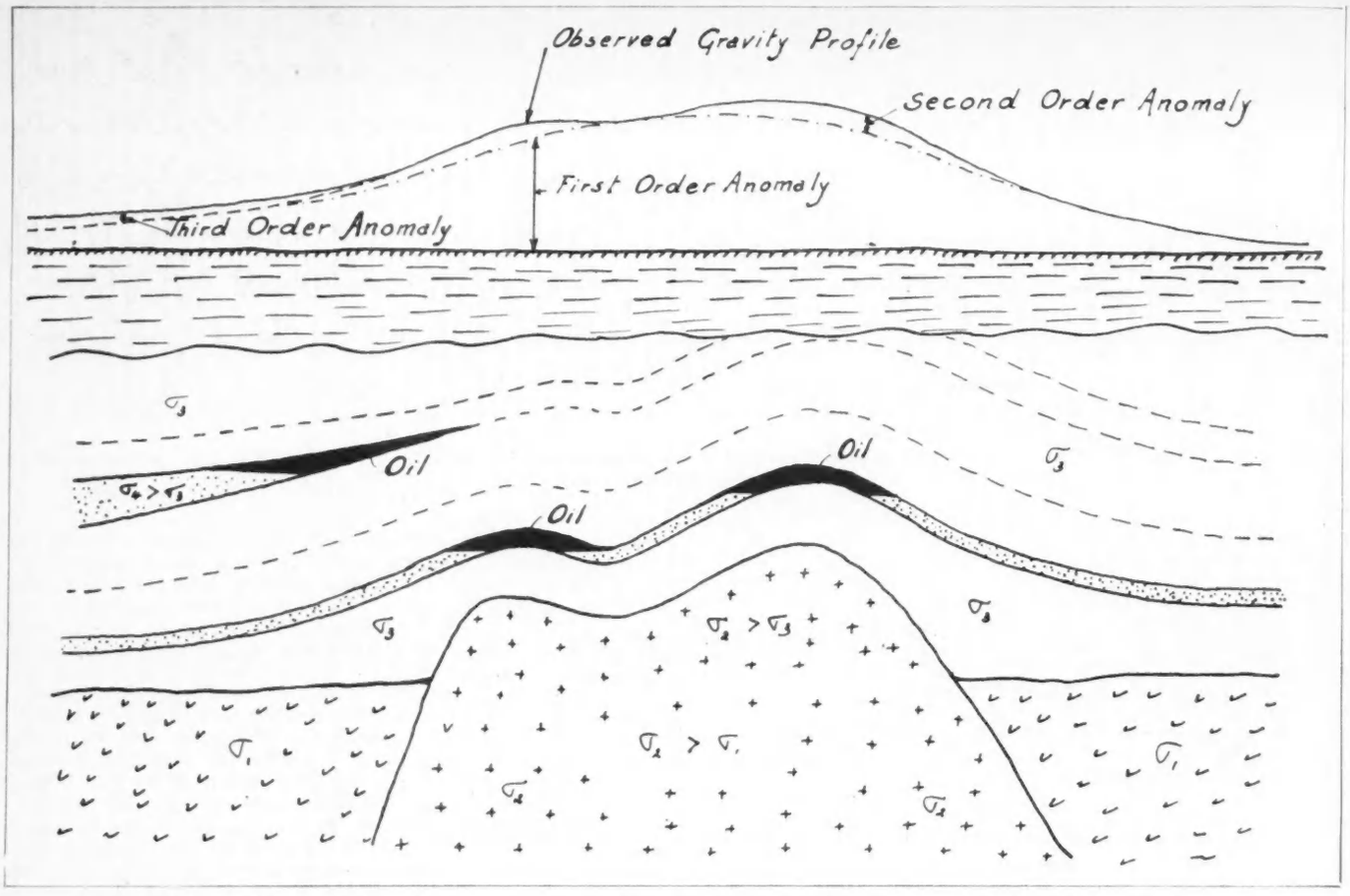


Figure 8. Schematic diagram illustrating gravimetric anomalies of various order of magnitude and their possible geologic causes.

geological effects are apparently hopelessly scrambled. The unscrambling process calls for a great deal of judicious assumptions which can be made safely only from a proper knowledge of available geological information.

The first task is to eliminate the non-structural effects. These appear as broad and extensive highs or lows and are most commonly ascribed to vertical density contrasts in the basement rock such as might be produced by a batholithic intrusion (Figure 8). The removal of this first order regional anomaly is made by assuming that the basement is flat and that the vertical density contrast is entirely responsible for the broad anomaly. Yet, this removal must be made without impairing the second and third order anomalies which are structurally and stratigraphically significant. This process is very critical and it is here that the experience of the interpreter will prove a valuable asset in selecting the extent of the area over which to average the gravitational values before subtracting them from the overall map. The result will be a map containing second and third order anomalies. When the basement rock is at great depths, the first order anomalies appear as very broad features and it is often unnecessary to remove them (and it might even be better not to remove them) before making the structural interpretation.

The quantitative structural interpretation of second order anomalies has been adequately reviewed in a recent paper[25]. As a further example of the method of "gravitational focusing" used in unscrambling merged gravitational anomalies produced by deep structures a hypothetical survey over three deep salt domes and its interpretation is given in Figure 9. The salt domes are assumed to be hemispherical in shape and of one half-mile radius. They are buried at a depth of two miles and protrude from a flat basement surface. At such a depth for salt (on the Gulf Coast for instance) a density contrast of about 0.25 is expected, with the salt ($\delta = 2.25$) less dense than the intruded sediments ($\delta = 2.50$). The negative gravitational anomaly was computed by means of well known formulae for each dome and the results were added so as to obtain the upper left picture showing the contoured gravitational anomaly in plan view with the commonly used contour interval of 0.2 milligal. The surface gravimetric anomalies were calculated to the nearest 0.01 milligal, although it is realized that no present day gravimeter may give a dependable reading to such a high precision. It will be observed that the surface gravitational picture indicates a single broad minimum. The qualitative interpretation of such an anomaly would most certainly be that there is a deep and extensive salt dome under the exact center of the figure. A well drilled at that location would most certainly miss the structure. If on the other hand it is decided to drill for a flank sand, the contour line —0.2 mgl. might be chosen as a likely possibility to be tested in various places, leading again to some very expensive dry holes.

Few wildcatters venture such guesses, as they have learned by bitter experience that a gravimeter map gives only an out-of-focus picture of sub-surface structures. Usually they will resort to some other means of geophysical confirmation, such as by the seismograph, though it is possible at little additional expense to obtain a satisfactory interpretation of gravimeter data of sufficient quality to justify the definite locations of exploratory wells. Such as interpretation is given in the upper right of Figure 9 and it may be seen that the method of "gravitational focusing" has disentangled the geological situation in a satisfactory manner.

The problem of gravimeter interpretation may be divided into two parts: that of *intrusive structures*, and more particularly salt dome interpretation; and that of *non-intrusive structures*.

Salt domes may be classified into three classes which give characteristic anomalies:

1. Shallow salt domes. These are generally surmounted by a thick and heavy cap rock. Accordingly, the gravitational anomaly will be a broad minimum due to the salt plug's mass deficiency at the deeply buried base, whereas the center of the large negative anomaly will exhibit a sharp maximum due to the cap rock. Examples of this type are Damon Mound and Nash Dome on the Texas Gulf Coast.

2. Medium depth salt domes. These are generally surmounted by an unimportant cap rock and the density contrast of the upper part of the salt dome with the contiguous sediments is likely to be negligible. Accordingly, the gravitational effect is generally similar to that of a deep salt dome. The proper interpretation of this type of anomaly is unusually

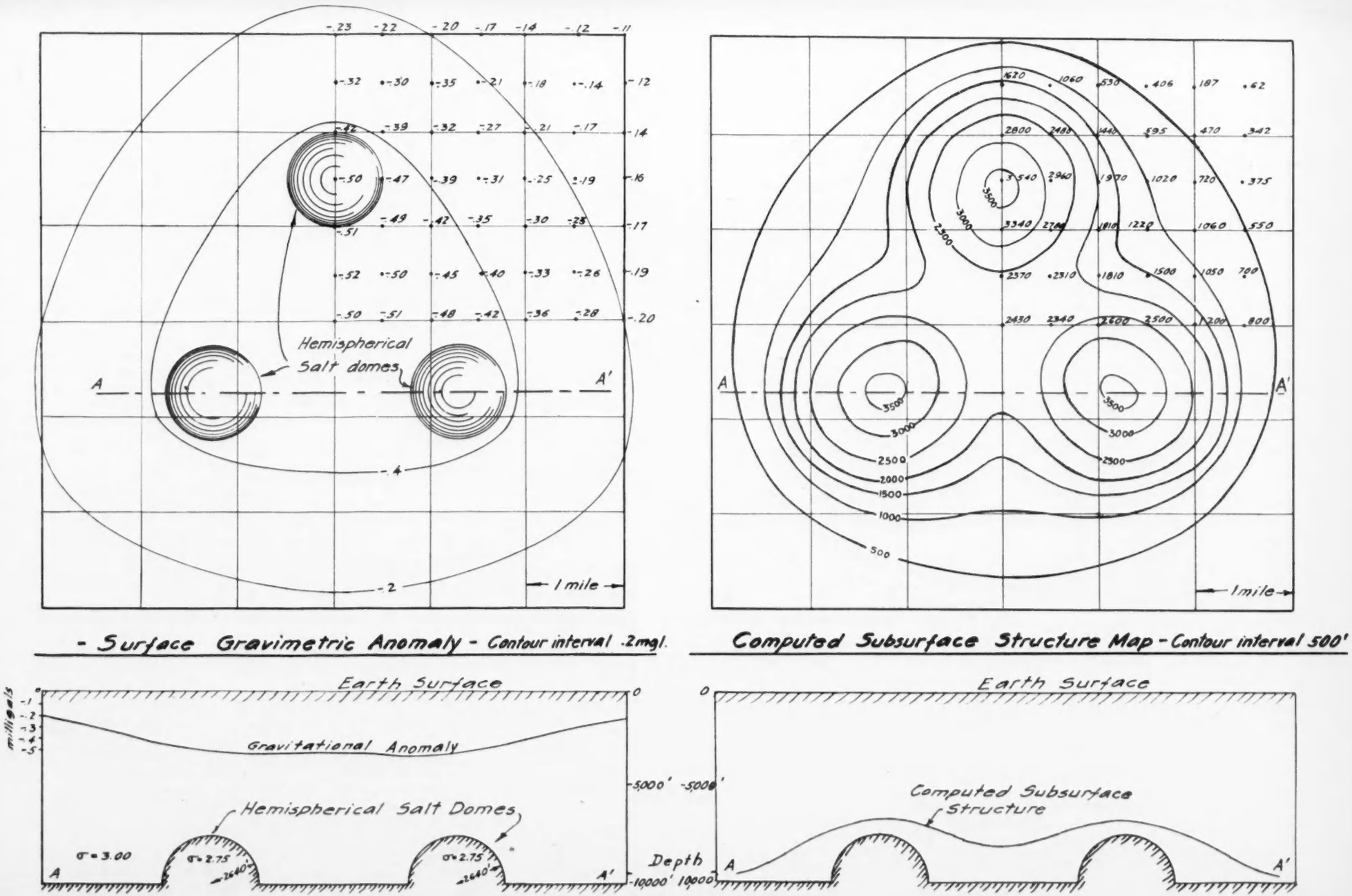
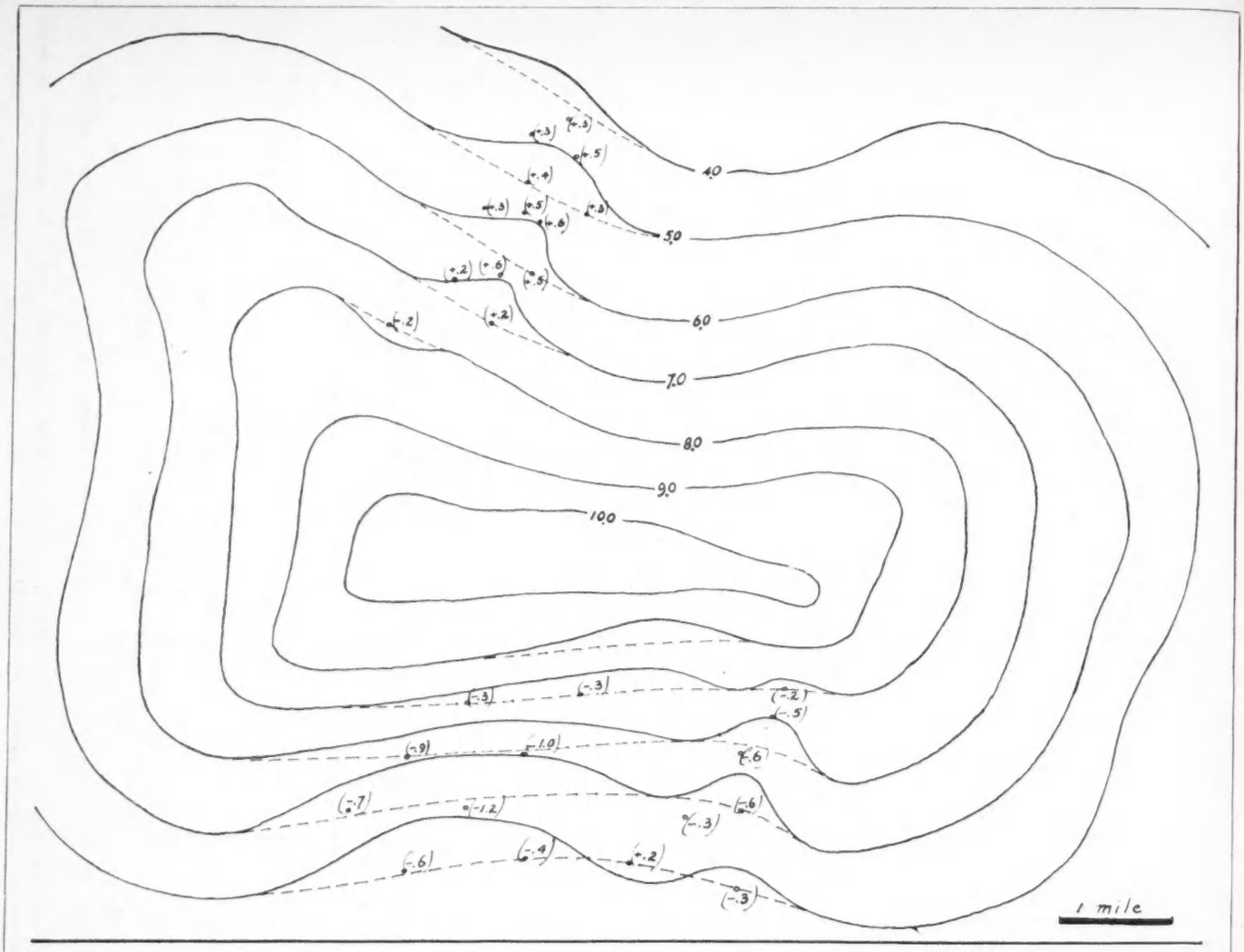


Figure 9. Computed gravimetric anomalies over three deep hemispherical salt domes illustrating the merg ing of their respective anomalies and how they may be successfully resolved by "gravimetric focusing." (Dome radius: ½ mile. Depth to center: two miles. Density contrast [mass deficiency]: .25.)



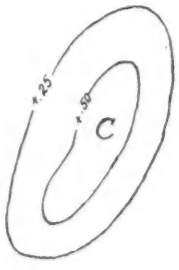


Figure 10a (above). Hypothetical gravimetric map showing anomalies of first and second order.

Figure 10b (below). Residual or second order gravimetric anomalies after removal of first order anomaly presumably produced by an intrusional basement density contrast.

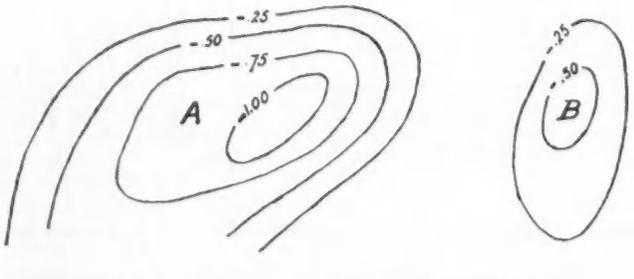
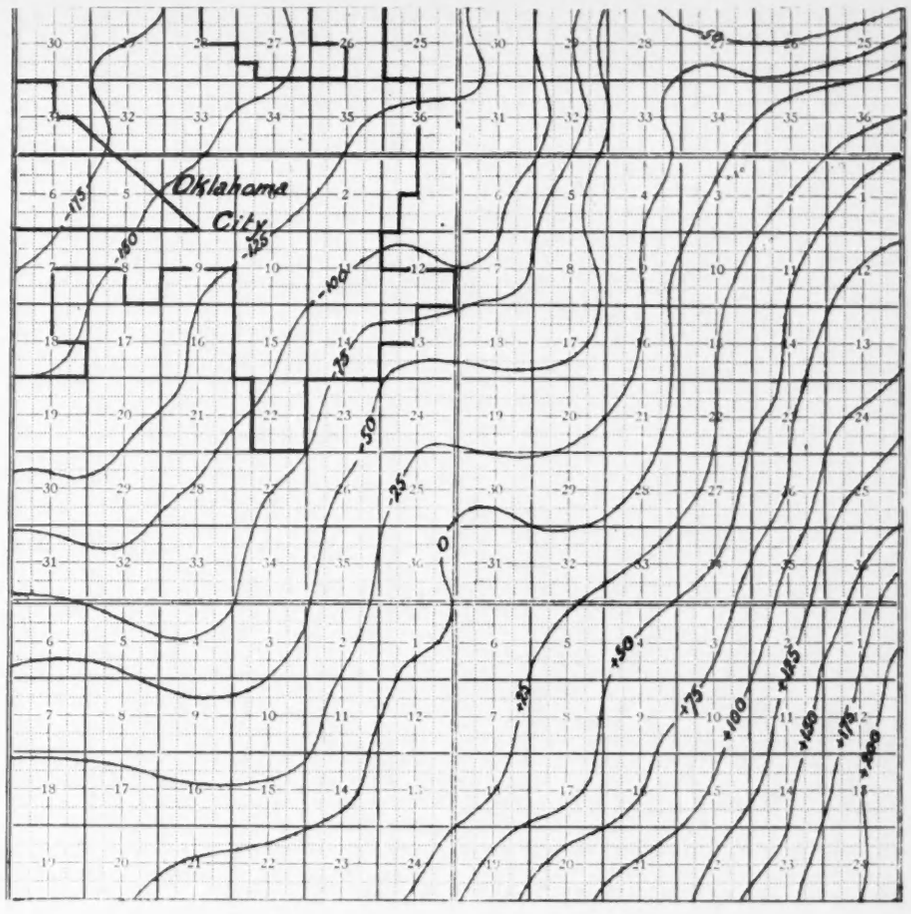


Figure 11a. Magnetic map over the Oklahoma City field after O. C. Clifford, Jr. (AAPG Bull., Vol. 16 (12) pp. 1171-76) with modifications from other sources.



difficult and there is great need for a high precision gravimeter survey if a quantitative interpretation is to be had.

3. Deep salt domes. These have only an insignificant if any cap rock at all and the gravity contrast is all negative. Due to the great depth of burial the anomaly is very broad and there is a possibility for the merging of several anomalies into one extensive gravitational low as examplified by Figue 9. In this case the method of "gravitational focusing" is a *must* if the individual structures are to be resolved from the faint ripples within the overlapped anomalies. There is need for a detailed or narrow mesh station system and the precision of the measurement should approach 0.01 mgl. Examples of such deep salt domes with merged negative anomalies are Mykawa, Manvel, Friendswood, Hastings and Genoa in the area south of Houston.

Non-intrusive structures are related to basement topography, and the expectation of a sedimentary structure overlying irregularities in the basement is predicated upon the assumption of gravitational compaction of sediments around buried hills such as monadnocks, granits ridges, igneous intrusions or due to rejuvenation of basement folds or faults. Gravitational anomalies may also be produced by density contrasts within the sediments, as previously indicated. Accordingly, the problem of interpretation of non-intrusive structures may be divided into three steps:

1. Elimination of regional anomalies of the first order due to basement density contrast.

2. Interpretation of second order anomaly from basement topography in terms of structure.

3. Elimination of second order anomaly due to basement topography and interpretations of third order anomaly in terms of stratigraphic lateral changes.

The process is illustrated by means of Figure 10a, which represents an assumed gravimetric map of the type that might well be encountered in many American petroliferous provinces, particularly in Kansas, Oklahoma, West Texas, and the southeastern states, Florida, Georgia. When the gravimetric readings are contoured, a large positive gravitational anomaly is evidenced with a total relief of about six milligals. If the basement is estimated to be present at a depth of two miles and the density contrast assumed to be 0.25, a structural relief of 8000 feet would be suggested which in the type of province cited above is an unlikely occurrance. Accordingly, it is expected that the big anomaly (first order) is produced by a large intrusion within the basement such as might be the case for a basic intrusion within an

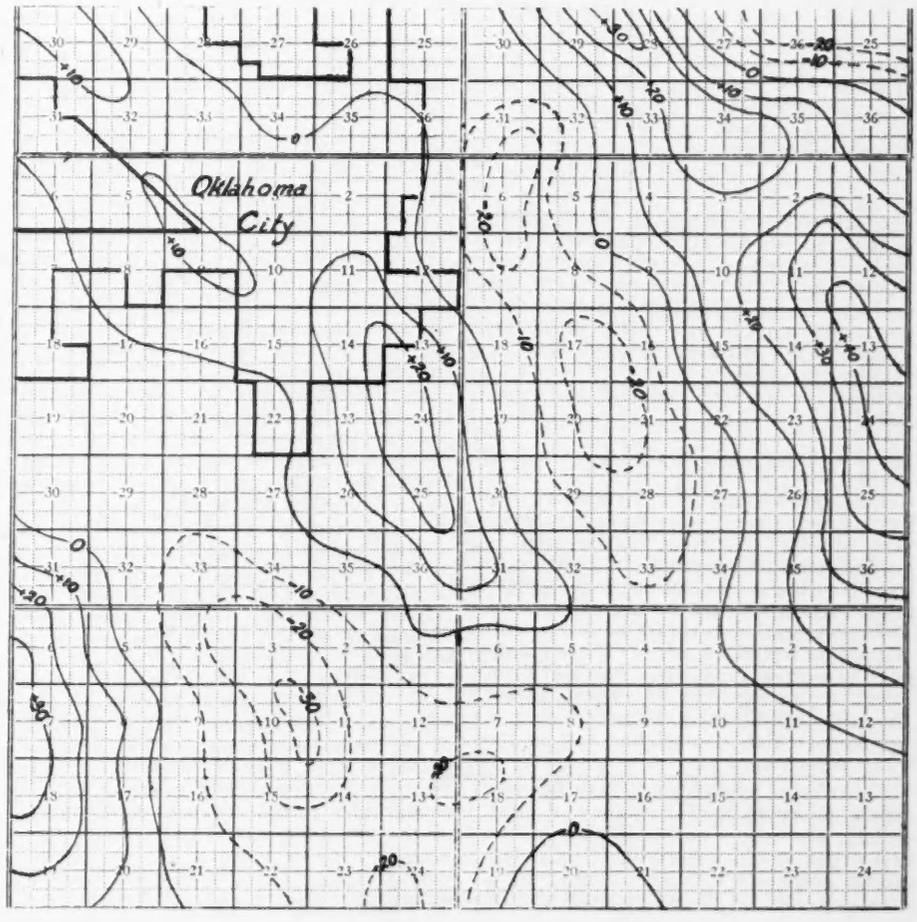


Figure 11b. Residual or second order magnetic anomaly after removal of first order anomaly presumably produced by basement magnetic polarization contrast.

acid basement. (A magnetic survey would most certainly confirm such an assumption.) Therefore, one is justified in eliminating the large anomaly from the point of view of its influence upon the sedimentary structure. The process by which this is normally done consists in idealizing the big anomaly by giving it a shape corresponding to that which one might think it should be. In this work it is helpful to consider that the effect of deep geologic anomalies should be smooth and gradual, showing no abrupt variations or sharp gradients. Rapid horizontal variations of gravity are most certainly the result of shallower influences. The elimination of a first order anomaly is influenced greatly by the personal equation of the interpreter, his geologic background and undertstanding of the geology of the region as well as of the geophysical principles involved. No two interpreters are apt to arrive at identical conclusions.

As an illustration, the idealization of the anomaly of Figure 10a is shown in dotted lines; they indicate what the anomaly should be if it were produced by an intrusion devoid of protrusions above the basement rock surface. The second order anomaly, therefore, is the difference between the theoretical value at a station (obtained by interpolation) and the actual value. Those differences are indicated in parentheses at the appropriate stations. At those stations showing no such values, the difference is zero. By replotting on an areal map the differences so recorded, one obtains the second order anomaly map shown in Figure 10b. This is the structurally significant map; it indicates two negative anomalies (A and B) produced by depressions in the intrusional mass and accordingly devoid of possibilities for structural accumulation of oil and gas. The only anomaly of interest from the economic point of view is the positive one (C). By assuming a density contrast of 0.25 one may estimate a relief of about 1750 feet for this feature which is amply sufficient to justify the expectation of a compaction fold in the overlying sedimentary section.

The isolation of a third order gravitational anomaly is a very difficult problem seldom possible as a result of the paucity of geological information in undrilled territory. It is only a mere possibility in drilled territory where the problem is that of finding a sedimentary pinch-out on the rim of a structure. Properly, this problem belongs to prospecting for stratigraphic traps in which section its remote possibilities were stated.

Magnetic Methods

The delineation of a structural trap by magnetic surveying faces problems very similar to those encountered in gravitational prospecting. In addition to the structure's association to basement relief there also must be present a magnetic polarization contrast between sediments and basement rocks. These conditions are often satisfied in the Mid-Continent region and its is expected that favorable conditions are also present in the Appalachian geosyncline and in the southeastern states.

As with the gravitational case we may expect to encounter anomalies of first, second, and third order. Those of the first order would be produced by polarization contrasts in the basement rock, irrespective of relief and accordingly devoid of economic significance. The second order anomalies are those which are structurally significant, but it must be noted that negative anomalies may now be as significant as the positive ones. As a matter of fact with a positive anomaly must always be associated a negative anomaly of equal weight. The third order anomaly would again have a stratigraphic significance with the attendant difficulties of interpretation.

An example of application will be given in the case of the magnetic anomaly observed over the Oklahoma City field before its discovery in 1928. (Figure 11a). It may be noted here that no prominent magnetic relief is observed, only small ripples being present in the contour lines. By smoothing these out in a manner similar to what was done in gravitational interpretation and subsequent subtraction of the two maps, one obtains the second order anomaly shown in Figure 11b. The latter is composed of a positive anomaly exactly over the presently known field and a negative anomaly to the northeast. Other interesting anamolies are also present in this map which might have economic significance, notably in the northeast portion of the area.

Telluric Current Method

In 1939, M. Schlumberger[29] proposed the utilization of the natural earth electric currents for the investigation of the configuration of the topography of the crystalline basement.

The proposal is predicated upon the existence and vagrancies of said currents which form great whorls of circulating electric energy of a fairly uniform pattern on the face of the earth with respect to the sun. Normal telluric currents form closed systems for the circulation of electric charges over the earth's crust within eight sectors of the globe obtained when considering the plane of the equator and two orthogonal meridional planes, one of which passes through the sun.

Consider the two sectors facing the sun in the Northern Hemisphere. Over them circulate two great whorls of electric current in opposite rotation in each sector, with lines of flow converging from the north toward the equator where they diverge in opposite directions. A mirror image of the above circulating system is obtained in the two southern sectors facing the sun. The dark sectors are also the object of electric current flow but of reduced intensity and regularity. The entire telluric current system is fixed with respect to the sun, and as the earth rotates the currents change in direction and intensity so that at any one point on the earth the potential gradient has taken probably all possible directions within 24 hours, although the resulting gradient is predominantly directed in a southern direction in the Northern Hemisphere. As a result of the higher resistivity of crystalline rocks with respect to sediments, the telluric currents are mostly concentrated within the sedimentary section. Accordingly a sedimentary basin, such as a geosyncline, would offer a more conductive path to the current's passage than where sedimentary beds are thin. Structural relief over the basin's topography would result in a reduction of the available conductive sedimentary section and an increase in the basin's overall resistance. It is assumed that the quantity of telluric current flowing in a sedimentary basin is fairly constant at all points; therefore, a higher potential gradient is expected to be measured over a basement uplift, a likely place to find a structural accumulation of petroleum. Hence, a geophysical process is immediately indicated which consists in determining the distortion of the telluric potential gradient over prospective sedimentary basin.

In practice, numerous difficulties are encountered. According to Dahlberg,[30] the telluric currents are not continuous but are composed of a large number of frequencies from zero to several kilocycles, constituting a noise so to speak. At low frequencies they consist principally of isolated impulses of random amplitude. These might be the result of the seimic-electric effect, spontaneous electrode potential changes, piezoelectric effect, distant atmospheric discharges, etc.

If the claims of Schlumberger[29] are correct, he has been able to overcome the above difficulties in using telluric currents for the delineation of basement relief in sedimentary basins, notably in Sumatra and southwest France, and to locate salt domes in the Alsatian Plains.

Relative measurements only are made since it is not possible to determine the absolute resistivity when the value of the input current at the electrodes is unknown. Here, for practical purposes the electrodes may be considered as removed to infinity. Potential differences between two pairs of fixed orthogonal electrodes are compared to the potential differences between a similar pair of mobile electrodes. Recording potentiometers are used for this purpose and records are taken for a period of about 20 seconds. Afterwards, the ratio of the simultaneous impulses at the mobile and fixed stations is computed and plotted on the map. If the fixed set of electrodes is known to be over a deep part of the sedimentary basin, high ratio at the mobile station would indicate a significant basement relief.

The work of Dahlberg[30] throws considerable doubt on the validity of the above line of reasoning but it is possible that means of overcoming the difficulties involved have been found. Besides those mentioned above, there are certainly many sedimentary inhomogeneities which could be reflected in the measurements and which could be interpreted as a shortening or thickening of the sedimentary section such as, for instance, replacement of connate water by gas or oil, thickening of shales, lateral facies changes from continental to marine, etc.

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[To be concluded]

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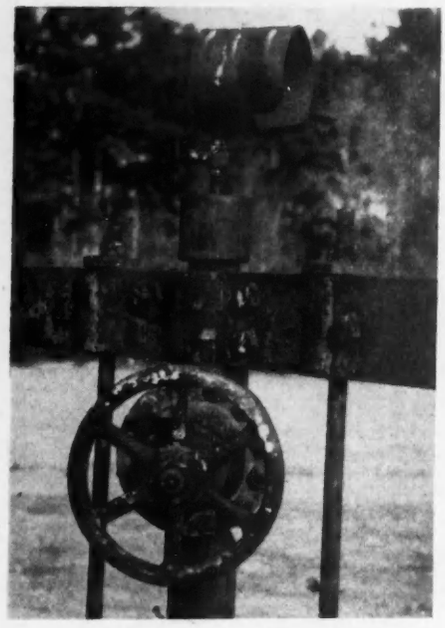

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WELL HEAD EQUIPMENT

Borrowing an idea from the hoods used by railroads to make semaphore lights visibile in daylight, even against a bright sky, one operator equips the gauge at the top of his Christmas tree with a shaped cover which excludes tangential light and makes the gauge readable from a distance.

The hood is formed from a coffee can of the proper diameter to fit snugly around the gauge body, with a slot cut along the base to slip over the ¼-inch gauge line. The hood is held at this point by a conduit half-nut, slipped into place before the gauge is positioned, the nut being screwed up the thread to clamp the hood metal between it and the base of the circumference of the gauge shell or body.

The hood is cut away to the edge of the gauge body at the bottom, to prevent the entrapment of water and dirt, and also to discourage bird-nesting in what might otherwise prove an attractive site.

The hood, painted to protect it against rusting, will last indefinitely in service, and is readily replaced or renewed if damaged during work-overs of the well.

Brine Water Line Support From Salvaged Material

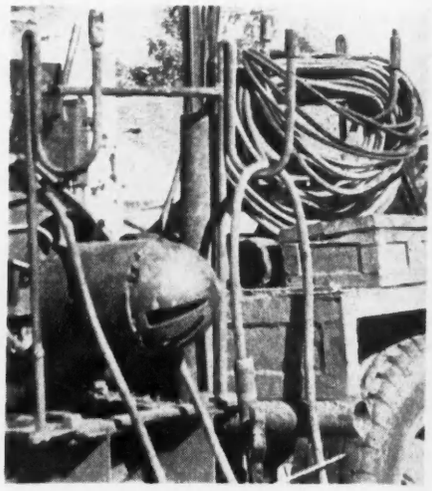
WATER DISPOSAL

Where a salt-water disposal line had to cross a boggy swale which, at times, carried considerable flood water, protection against cramping or concentrated stress in the asbestos pipe was afforded by carrying each joint in a pair of cradles. The line merely rested of its own weight, without fastening or anchorage other than that afforded by the line buried at either side of the elevated section.

Each cradle consisted of a pair of two-inch pipe posts, set with a post-hole digger and bedded in concrete to afford greater bearing than that afforded by the pipe. Wide U-shaped saddles, with the outer ends turned down to fit within the pipe posts, were placed in each pair of posts. The curve of the U-shaped section was on a radius equal to twice that of the diameter of the pipe to be carried, the depth of the sag being approximately that of the pipe diameter.

Pipe laid in these cradles could be lined up quickly, and the joint rings tightened in place without there being concentrated stress against any point of either joint of pipe. The entire line may shift slightly under impact or pressure of flood-borne debris without overstressing; returning to its original lay after the waters go down again.

Welding Hose Racks

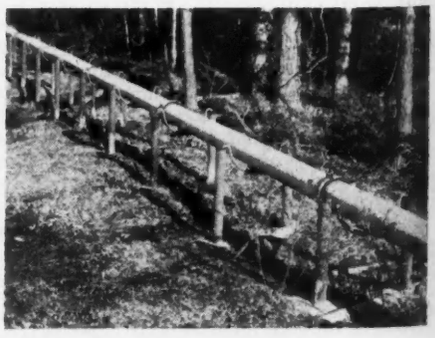


WELDING EQUIPMENT

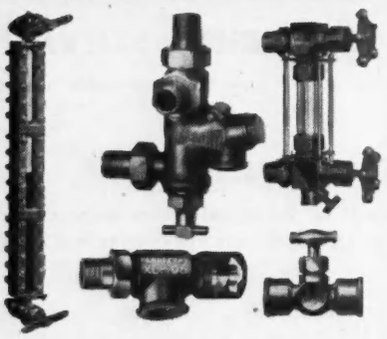
By heating and bending the ends from two pieces of ¾-inch discarded shackle rods into the form of a U with the extending end of each piece of rod bent back on itself through 180 degrees, one pipe line welder contrived a convenient rack upon which to hang the coiled cables from his portable electric arc welding generator that was mounted behind the cab on his truck. The bottom ends of the upright hooks were welded to a flat strip of steel, three inches wide and ⅝-inch thick. The flat base piece was drilled with two 1-inch holes for bolting the rack to the truck bed.

To provide rigidity, a piece of shackle rod was welded horizontally a few inches below the top end of the U-hooks, between the upright supporting legs as shown.

A similar rack, but with shorter legs, was built and mounted farther back on the truck to accommodate the oxygen and acetylene hoses for the gas-welding torches. Such cable and hose racks provide a convenient means for keeping the coils of cable or hose intact while the mobile unit is in transit or when the arc or gas type of welding is not being used. They are simple and inexpensive to construct and mount.



PENBERTHY
QUALITY
PRODUCTS



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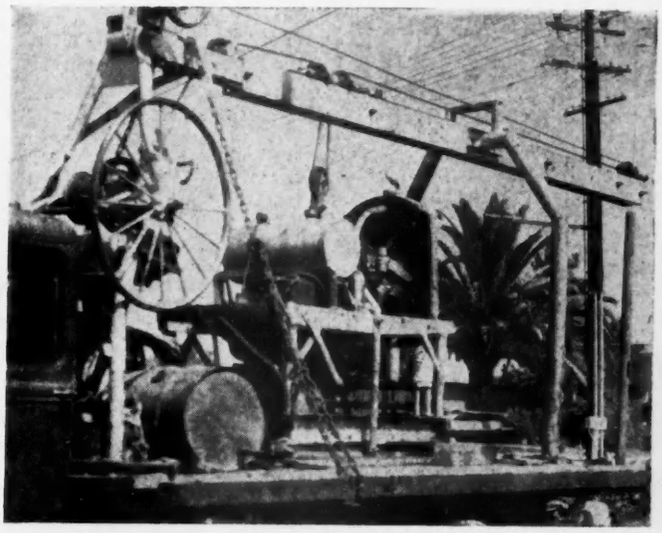
DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

PRODUCTION HINTS

Detachable Trolley Aids Loading and Unloading Truck



LIFTING DEVICES

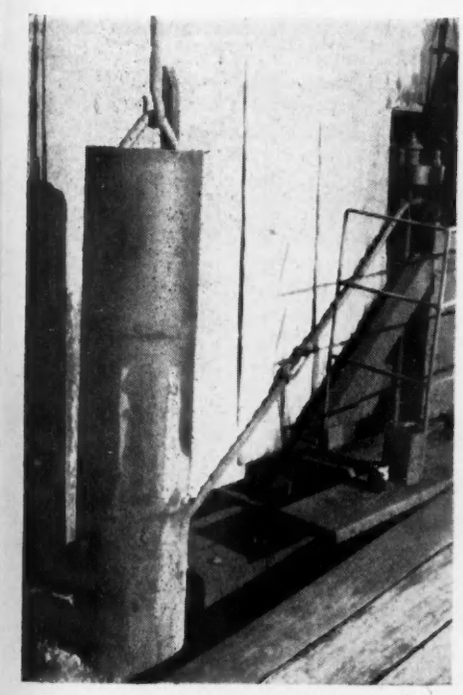
When it is necessary to handle heavy equipment, such as welding machines, portable engine-driven pumps, large valves, and other lease material, a detachable trolley device, such as the one illustrated, has been found to be of great convenience and labor saving in loading and unloading such heavy objects.

It consists, primarily, of a framework of shaped pipe which supports a split trolley track made up of matched angle iron. The trolley is rove into a soft laid line, anchored at the cab end and doubled back through a sheave at the opposite end. The free end is attached to a drum of a hand-operated winch so that positive control is obtained at all stages of the loading and unloading operation.

The heavy load is lifted by a hook in the free moving line which drops between the pair of sheaves mounted on roller above the track.

The hand-winch mounted on the framework controls the travel of the trolley along the track. The four pipe legs of the lifting device fit snugly into sockets provided in the truck bed, making it possible to remove the entire apparatus when not needed. When mounted on the truck, sockets on the bed hold the framework in place, and further safety is obtained by booming the load down with a chain and load binder near the front end.

Counterweight Housing Prevents Injury To Workmen



SAFE PRACTICES

Lessening danger of employes becoming entangled in or being struck by counterweights of a standard-end pumping well, one company provides an enclosure in which a cylindrical counterweight can operate. Made of a section of approximately 18-inch stovepipe set in the ground beneath the counterweight hanger, the housing also serves to confine the weights without having them anchored to a hinged mechanism attached to the derrick or belt hall structure. Depth to which the enclosure is buried depends upon the well load and corresponding counterweights needed.

Detachment of the counterweight arm is simplified, it being necessary only to slip a steel bar through the bail of the weight when the latter is exposed at the top of its stroke as in the position shown. Further savings are realized with such a hook-up by eliminating necessity of constructing a guard rail along the entire length of the walkway beside the belt hall.

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Peak Wildcatting Year Indicated

THE number of exploratory well completions during the first two months of this year indicates that 1947 is well on its way to become the all-time peak wildcatting year. There have been almost 13 percent more wells of this classification drilled than in the comparable period of last year, when previously existing records were broken.

This year's drilling program should derive some stimulus from the recent raise in crude prices, but the shortages of tubular material may more than offset any boost that the pay hike may provide. Shortness in supply of drill pipe and casing will undoubtedly prevent some operators from fulfilling their year's schedules; although the drill pipe situation is easing, the casing problems appear to be getting worse.

During the first two months of this year there were 775 exploratory wells completed against 689 completions in the same months of last year, an increase of 12.5 percent. The successful-well portion of the current period's total amounted to 19 percent, while last year's period recorded a success ratio of 20 percent.

So far this year 99 wells have discovered new oil reserves against 73 for last year's period, an increase of 26 discoveries or 35.6 percent. These new finds included 60 new oil fields against 51, and 39 new reservoirs in existing fields against 22 last year. Major extensions to existing oil fields dropped from 24 in last year's period to 15 this year.

New sources of distillate found this year also increased over the previous period, there having been 17 new discoveries compared with six. These were six new fields against two, and 11 new pay horizons against four. Extensions to this type of field dropped from eight last year to three for this year's months.

New gas discoveries have been less

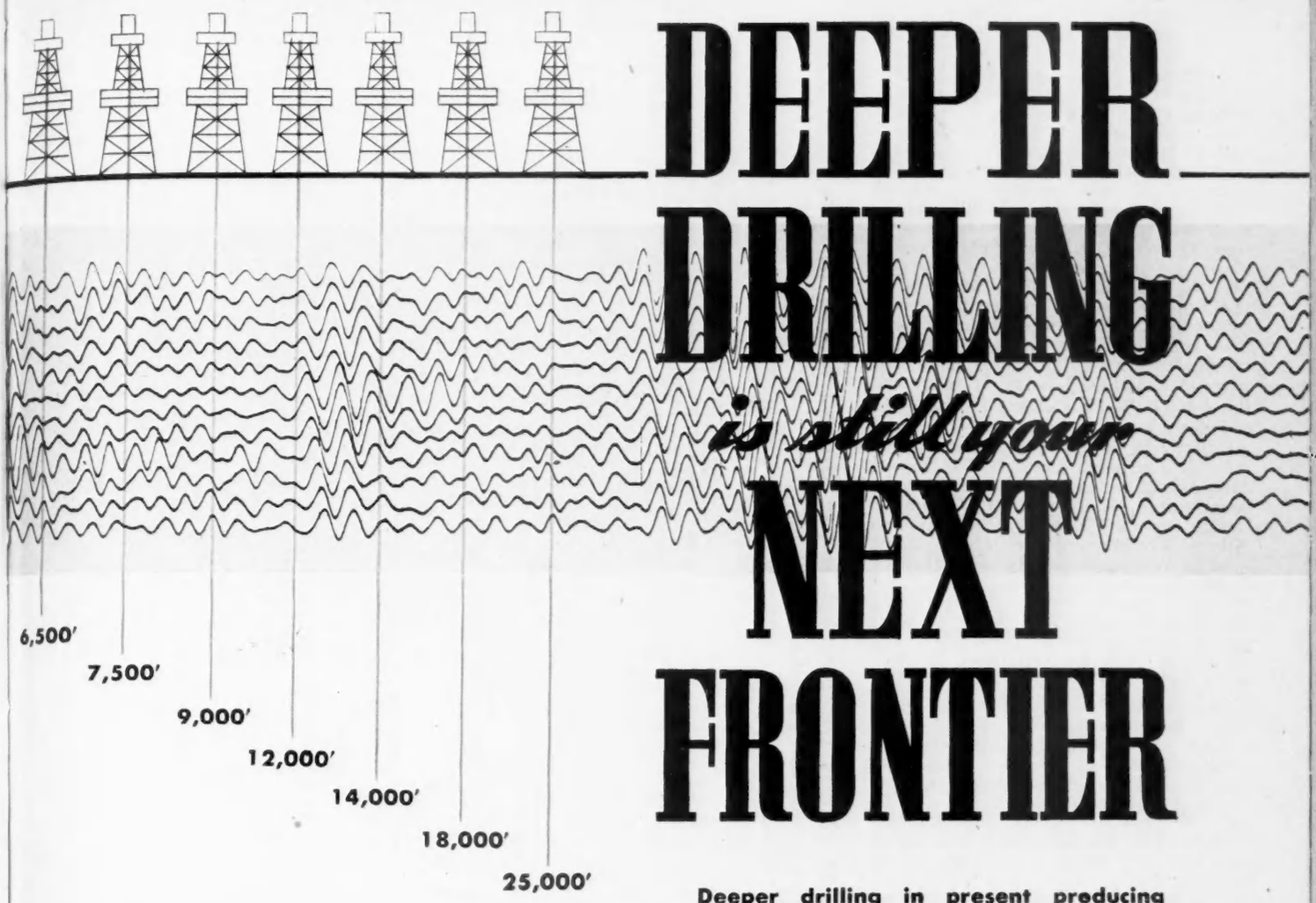
Summary of Results of Exploratory Drilling

ITEM	Feb., 1947	Jan., 1947	Two Months: Jan.-Feb. 1947	1946	Percent Diff.
Oil Discoveries	47	52	99	73	+ 35.6
New Fields	29	31	60	51	+ 17.6
New Pays	18	21	39	22	+ 77.3
Distillate Discoveries	9	8	17	6	+183.3
New Fields	2	4	6	2	+200.0
New Pays	7	4	11	4	+175.0
Gas Discoveries	6	6	12	27	— 55.6
New Fields	2	6	8	19	— 57.9
New Pays	4	.....	4	8	— 50.0
Total Discoveries	62	66	128	106	+ 20.8
Extensions to Fields	14	5	19	32	— 40.6
Oil Fields	11	4	15	24	— 37.5
Distillate Fields	2	1	3	8	— 62.5
Gas Fields	1	.....	1	.....	.....
Total Prod. Tests	76	71	147	138	+ 6.5
Dry Holes	293	335	628	551	+ 14.0
Wildcats	286	323	609	530	+ 14.9
New Pays	5	6	11	16	— 31.3
Outposts	2	6	8	5	+ 60.0
T'l Exploratory Tests	369	406	775	689	+ 12.5
Percent Productive	20.6	17.5	19.0	20.0	.....
Percent Dry	79.4	82.5	81.0	80.0	.....

Results of Exploratory Drilling in February and First 2 Months, 1947-1946, By Districts

State or District	MONTH OF FEBRUARY, 1947														FIRST TWO MONTHS, 1947																	
	Productive Tests										Unproductive Tests				Productive Tests										Unproductive Tests				Total Exploratory Tests	
	New Fields			New Pays			Extensions			Total Productive	Wildcats	New Pays	Outposts	Total Exploratory Tests	New Fields			New Pays			Extensions			Total Productive		Wildcats	New Pays	Outposts	Total Dry			
	Oil	Gas	Dis.	Oil	Gas	Dis.	Oil	Gas	Dis.						Oil	Gas	Dis.	Oil	Gas	Dis.	Oil	Gas	Dis.	2 Mo. 1947	2 Mo. 1946				2 Mo. 1947	2 Mo. 1946	2 Mo. 1947	2 Mo. 1946
Alabama											2			2												2			2	2	2	2
Arkansas											3			3										1	6				6	7	6	8
California											18			18				1						1	6	36			36	45	37	51
Colorado	1									1	4			5	1									1	1	4			4	3	5	4
Florida											4			4												7			7	4	7	4
Illinois	4			2			4			10	19			29	8			7			6			21	11	52			52	59	73	70
Indiana											8			8											3	14			14	6	14	9
Kansas	5	2						1		8	26			34	8	2						1		11	14	56			56	46	67	60
Kentucky											4			4											5	10			10	15	10	20
Louisiana	1			3		2	1			7	13			20	4			7		6	1		1	19	10	35			35	21	54	31
N. Louisiana											8			8	1								1	2	2	21			21	15	23	17
S. Louisiana	1			3		2	1			7	5			12	3			7		6	1			17	8	14			14	6	31	14
Michigan							1			1	9		1	11							1			1	6	31		1	32	41	33	47
Mississippi							1			1	4			5		1					2			3		12			12	8	15	8
Missouri											2			2												7			7	1	7	1
Montana																										3			3	1	3	1
New Mexico	1									1	3			4	1									1	2	8	2		10	11	11	13
New York																														1		1
Ohio											2			2											9	7			7	7	7	16
Oklahoma	5									5	57			62	18	2	1				1			23	24	105			105	50	128	74
Pennsylvania																									2						2
Tennessee																															1
Texas	10		2	13	4	5	4		2	40	106	4	1	151	18	2	5	23	4	5	4		2	63	37	208	7	7	222	215	285	252
Dist. 1 S. Central	1									1	12			13	2									2	2	22			22	11	24	13
Dist. 2 Middle Gulf			1	1	1	1	1			5	10			15			2	2	1	1	1			7	1	19			19	1	26	1
Dist. 3 Upper Gulf					2	1			2	5	8			13	2	1	2	1	2	1			2	11	6	21			21	21	32	27
Dist. 4 L. Gulf-S.W.	3		1	2	1	3				10	13		1	24	4	1	1	5	1	3				15	7	32		2	34	47	49	54
Dist. 5 E. Central											6			6											2	12		1	13	2	13	2
Dist. 6 Northeast											4			4											5	6	1		7	19	7	24
Dist. 7-B N. Central	2			5						7	14	2		23	4			6						10	3	41	2		43	3	53	3
Dist. 7-C W. Cent.							1			1	3			4							1			1	4	3		1	4	4	5	4
Dist. 8 West	1			2			1			4	8	1		13	1			5			1			7	8	17	2	3	22	65	29	73
Dist. 9 North	2			3			1			6	28	1		35	4			4			1			9	9	35	2		37	47	46	56
Dist. 10 Panhandle	1									1				1	1									1						5	1	5
Utah																									1							1
West Virginia																									2				3		5
Wyoming	2									2	2	1		5	2			1						3	4	6	2		8	4	11	8
Total U. S.	29	2	2	18	4	7	11	1	2	76	286	5	2	369	60	8	6	39	4	11	15	1	3	147	138	609	11	8	628	551	775	689

[1] Dist. 2 included with Dist. 4. [2] Dist. 5 included with Dist. 6. [3] Dist. 7-B included with Dist. 9. [4] Dist. 7-C included with Dist. 8.



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numerous so far this year as only 12 new sources have been uncovered against 27 in last year's comparable period. These finds were 8 new fields against 19 last year and 4 new pay strata against last year's 8.

Although February's exploratory well completions total was not as large as January's, which were the result of a very active month, it kept up the pace and on a per-day basis showed some increase. During the month 369 exploratory wells were completed compared with the previous month's 406, and in each case the daily average was slightly over 13 wells. However, February's 76 successful wells amounted to 20.6 percent of the total, while January's 71 could only register 17.5 percent. Of these totals, February showed 319 rank wildcats completed and January 364. The remainder were attempts to locate new pays in established fields or to extend the boundaries of existing pools.

February brought Colorado its first oil discovery of the year in the Chromo field of Archuleta County. The Rocky Mountain area's other discoveries of the month were two oil fields in Wyoming. These were the Herrick Dome field in Albany County and the Neiber Dome field in Washakie County. The Herrick Dome appears to be a small field comprising a productive area of probably not over 800 acres. The Neiber Dome is producing from below 10,000 feet in the Big Horn Basin, with moderate development activity expected.

Illinois was rewarded with 4 oil fields, 2 new pay horizons, and 4 oil field extensions for its exploratory efforts. The new fields were found in Clay, Effingham, Marion and White counties. The most promising of these finds appears to be the new Concord Central field in White County. The discovery well of this new pool, W. O. Allen's Ackerman 1, was completed as a pumper making 135 barrels a day from the Aux Vases sand, and at the end of the month four other wells were drilling in this area.

Of 34 attempts Kansas netted 5 oil fields, 2 gas fields, and 1 gas field extension. Three of these new oil fields were located in Ellis County and one each in Kingman and Stafford counties. One of these Ellis discoveries, which is a mile west of the Burnett pool, made a depthograph potential of 3000 barrels per day from the Arbuckle lime, and the Kingman find made potential of 1500 barrels per day from the Viola.

Texas Completions

February's exploratory completions numbered 106 in Texas, of which 40 were successful. These successful wells yielded ten new oil fields and two new distillate fields. The remainder included new pay strata and major extensions. The most important of Texas' discoveries was also the year's first for the Panhandle district. This was the Petersburg field, Hale County, discovered by Stanolind Oil & Gas Company. A major drilling campaign probably will result from this important sweet oil discovery on the north end of the Permian Basin.

Oklahoma added five new oil fields in drilling 62 wildcats during February. Two of these fields were found in Cotton County and one each in Garvin, Oklahoma and Stephens counties. The most promising of the group seems to be the Garvin County field, between the Lindsay, North, and the Maysville, Southwest, pools.

New Oil, Distillate and Gas Fields and New Pay Horizons Discovered in the United States in February, 1947

Also Important Extensions to Established Fields

COUNTY	FIELD	COMPANY, WELL AND LOCATION	Date Spudded	Date Completed	Total Depth (Feet)	Completion Horizon (Feet)	[1]Name, Character and Age of Producing Formation	[2]Initial Production Method and Choke	Gravity of Oil	[3]Structure: [4]Method of Discovery	Tentative Evaluation of Discovery or Extension (Opinion of Relative Importance of Area from General Viewpoint of the Industry Based on Pertinent but Necessarily Incomplete Data: Later Development or More Complete Data Obviously Might Require Revision of this Tentative Opinion).
		COLORADO—New Oil Field									
Archuleta	Chromo	Florence & Teague's Fitzhugh 1, c ne ne 4-32n-1e, 8 mi sw Price (Gramps) fld.	.....	2-20-47	471	460- 471	Greenhorn li; U Cre	P 250	32	Ant-flt; sur	Structure has had number of dry holes, with oil shows in Dakota and other formations. Oil accumulation is probably due to faulting.
		ILLINOIS—New Oil Fields									
Clay	Kenner, W	Phillips Pet. Co.'s Spiker 1, ne se sw 23-3n-5e	12- 4-46	2-18-47	3058	2588- 2608	Cypress sd; Miss	P 95; 70 wtr	....	.....	1½ mi nw Kenner pl and on Xenia dome. 2nd well, not completed, looks good.
Effingham	Eberle	National Assoc. Pet. Co's A. Jacobs 1, se sw sw 24-6n-6e	12- 4-46	2- 4-47	2866	2823- 2834	McClosky li; Miss	P 118; 200 w	....	.....	1¾ mi nw Bible Grove pl. Offset drilling.
Marion	Miletus	National Assoc. Pet. Co's G. Boye et al 1, nw ne nw 21-4n-4e	12-19-46	2-18-47	2212	2199- 2210	Aux Vases sd; Miss	P 38; 22 wtr	....	.....	5½ mi fr nearest prod. 2 offsetts drilling.
White	Concord Cent	W. O. Allen's Ackerman 1, ne ne sw 4-7s-10e	12- 4-46	2- 4-47	2913	2900- 2913	Aux Vases sd; Miss	P 135	....	.....	1½ mi s Concord pl and w New Haven, N pl 2nd well and 4 drilling.
		ILLINOIS—New Oil Pays									
Clay	Hoosier, N	National Assoc. Pet. Co's C. Wattles 1, ne se sw 35-5n-7e	12-30-46	2-25-47	2908	2891-	McClosky li; Miss	P 24	....	.....	2nd well in pl. Disc well prod fr Aux Vases sd.
Gallatin	Inman, N	Coy Oil Co.-Ashland O & R Co's Foster 1, nw se nw 11-8s-9e	1- 6-47	2-11 47	2360	2330- 2350	Hardinsburg sd; Miss	P 24; 2 wtr	....	.....	Previous prod fr Aux Vases and McClosky. Has revived drlg in pl which had only 1 producer
		ILLINOIS—Oil Field Extensions									
Clay	Sailor Springs Consol.	National Assoc. Pet. Co's S. Lee 1, ne nw ne 15-3n-7e	12-20-46	2- 4-47	2990	2949- 2959	McClosky li; Miss	P 84	....	.....	½ mile extension.
Wabash	Browns	Cherry & Kidd's Gray-Tanquary 1, ne nw ne 27-1s-14w	1-20-47	2-18-47	2963	2958- 2963	McClosky li; Miss	P 41; 15 wtr	....	.....	¾ mi ne ext. with dry holes between.
Wayne	Cisne	Nash Redwine's Wm. Lusk 1, s se se 3-1s-7e	9-21-46	2-18-47	3310	3215- 3218 3251- 3253	L O'Hara li; Miss McClosky li; Miss	P 17; 33 wtr	....	.....	½ mi s ext. Originally abnd then plugged to prod.
White	Trumbull	Pure Oil Co's M. E. Husk 1, se se ne 20-5s-9e	11-25-46	2-18-47	3352	3194- 3210 3288-	Aux Vases sd; Miss Rosiclare li; Miss	P 6; 31 wtr	....	.....	1¼ mile sw extension.
		KANSAS—New Oil Fields									
Ellis		Continental Oil Co's Warren Mortage 1, se ne ne 3-11s-18w, 1 mi w Burnett pool.	.....	2- 1-47	3625	3617- 3625	Arbuckle li; Ord	Sw 2088	....	Ant; dr	Good discovery; made depthograph potential 3000 BOPD.
Ellis		Skelly Oil Co's Allen 1, se se sw 22-11s-19w, 3 mi nw Solomon pl	.....	2- 4-47	3645	3639- 3645	Arbuckle li; Ord	P 323	....	Ant; dr- seis	Proves prod betw Solomon and Riverview pls.
Ellis		Stanolind O & G Co's Irvin 1, se se se 6-14s-19w, 3 mi e Pleasant pl	.....	2- 5-47	3874	3852- 3874	Arbuckle li; Ord	P 142	....	Ant; dr- seis	
Kingman		Plains Exploration Co's Swander 1, sw se sw 20-28s-9w, 3½ mi s Calisa	.....	2- 6-47	4565	4406- 4565	Viola li; Ord	Sw&F 340; ¼"	41.8	Ant; dr	One of best discoveries in County; made potential of 1504 BOPD.
Stafford		Virginia Drilling Co's Rose 1, ce ne se 22-21s-12w, 1½ mi e Simms pl	.....	2- 1-47	3604	3586- 3589	Arbuckle li; Ord	P 90	....	Ant; dr	No special signifiance.
		KANSAS—New Gas Fields									
McPherson		W. C. McBride's Waln 1, ne ne se 12-19s-1w, betw Canton and Canton N. pls.	.....	2- 5-47	2855	2832- 2855	Mississippi li; Miss	.28 mln	....	Ant; dr	No special signifiance.
Pawnee		Cities Service Oil Co's Becker 1, ne se nw 32-23s-15w, 2 mi se Benson oil pl.	.....	2-26-47	4175	4023- 4175	Arbuckle li; Ord	12.8 mln	....	Ant: dr	
		KANSAS—Gas Field Extension									
Seward	Hugoton	Stanolind O & G Co's Feathers 1, sw sw ne 15-35s-33w, 6 mi e ext	.....	2- 2-47	8243	6200- 6206	Mississippi li; Miss	5 mln	....	Ant; dr	Prod fr dpr pays than Hugoton's avge wells.
		SOUTH LOUISIANA—New Oil Field									
Calcasieu	Holmwood	Sohio's Farmers Ld & Canal Co. 2, swc 26-10s-7w, 5 mi w sw Bon Air fld	10- 8-46	2-10-47	11250	10350-10370	.....	F 292; $\frac{4}{64}$"	37.5	.....	Additional development expected.
		SOUTH LOUISIANA—New Oil Pays									
Beauregard	Longville	Barnsdall's Long Bell Lbr. Co. 2, 2000.3 e 650 s of nwc 1-6s-10w, ¼ mi nw discovery well.	12-28-46	2-27-47	9001	8570- 8586	Cockfield sd; Eoc	F 166; $\frac{4}{64}$"	49.9	.....	Import new sd. Additional development expected

St. Martin	St. Martinville	Continental's Fee 4-A, 990 fr swl 330 fr sel 169-ac tr, in 57-11s-6e	1-31-47	2-20-47	4992	4687- 4700	Sd; Miocene	F 68; 1/4"	28.3	Dp Dome	
St. Mary	Jeanerette, S.	Atlantic's Adeline Sugar Factory 1, swc 37-13s-9e	12-21-46	2- 9-47	7675	7145- 7180	Sd; Miocene	F 110; 3/64"	34.2	Dp Dome	
		SOUTH LOUISIANA—Oil Field Extension									
Jeff Davis	Welsh Dome, NW Flk.	Stanolind et al's T. S. Stegal 1, nwc 21-9s-5w, nw flk Welsh Dome	12-13-46	2-11-47	8233	6843- 6855	Sd; Oligocene	F 28; 2.1 mln; 3/16"	44.8	SD	Little importance.
		SOUTH LOUISIANA—New Distillate Pays									
Cameron	Cameron Meadows	Magnolia's Cameron Meadows Ld Co 45, fr nec Sect 28 go s 2660 w 2051 in 28-14s-13w.	12- 1-46	2- 3-47	9500	8678- 8696	Sd; Miocene	F 67; 7 mln; 7/64"	58	SD	No additional development expected.
Plaquemines	Delta Duck	Texas Co's Delta Duck State Lse 335-13, sec 31-20s-20e	12-13-46	2-14-47	9352	8678- 8714	Sd; Miocene	F 77; 5/64"	46.7	Dp Dome	
		MICHIGAN—Oil Field Extension									
Montcalm	Cato	Ohio Oil Co's Moyses-Keeney 1, se ne nw 9-12n-8w, 1 mi sw ext.	12-20-46	2-13-47	3543	3531- 3536	Monroe dolo & li; Devo	F 290; 6 wtr; 3/4"			Gives yr old Cato 1st gd promise of being developed into import reserve.
		MISSISSIPPI—Oil Field Extension									
Lincoln	Mallalieu	Sun's Summers 1, se sw 8-6n-8e, 3/4 mi nw ext	12- 6-46	2-18-47	10490	10428-10478	L Tuscaloosa sd; Cre	F 366; 1/16"	39.1	SD; seis	Fairly import as it is gd reserve addition to fld that has not shown much encouragement until last 6 months.
		NEW MEXICO—New Oil Field									
Lea		Devonian Oil Co's Browne-Federal 1, 660 snl and 580 ewl 19-9s-38e, 13 mi nw Landon fld, Texas.	12-15-46	2-14-47	5011	4926- 5011	San Andres li; Perm	F 121; 20 wtr 3/8"	25.4	Ant; geol	Lge prod are confirmed by near commercial prod found by outlying failures; crude yld per ac will be below avge for San Andres.
		OKLAHOMA—New Oil Fields									
Cotton		Akin & Dimock et al's Shaw 1, ne 28-3s-11w, 2 mi sw Essaquanahdale pool		2-25-47	1524	1518- 1524	Pennsylvania sd; Penn	P 152	37	Str trp; dr	Appears to be on trend with Soldier Creek, Essaquanahdale and Cache Creek pls. Trend runs nw to se.
Cotton		C. P. Burton's Pahdi 1, ne ne ne 24-3s-12w, 2 mi se Soldier Creek, SW fld.		2-26-47	1497	1483- 1489	Pennsylvania sd; Penn	P 175		Str trp; dr	Another shallow-prod pl in gen ar of Walters.
Garvin		Oil Carriers, Inc.'s Martin 1, cne ne 1-4n-4w, 4 mi se Lindsay, N. pl		2-15-47	10320	9070- 9229	Hunton li; Devo-Sil	F 341; .5 mln	41.5	Probable Trap; seis-dr	Proves gd prod betw Lindsay, N and Maysville, SW pools.
Oklahoma		J. J. Fleet's Patten 1, se se ne 26-14n-4w, betw Edmond and Edmond, W. flds		2-18-47	6605	6398- 6442	Bartlesville sd; Penn	F 67	40.3	Ant; dr	Shallower production than Edmond, W.
Stephens		Coline Oil Co's Cooper 1, se ne se 1-2n-8w, 3 mi nw Marlow		2- 5-47	12159	9015- 9040	Pennsylvania sd; Penn	F 15	40	Ant; seis-dr	Of no major importance.
		TEXAS DIST. 1 (S. Central)—New Oil Field									
Zavala	Del Monte	Texas Co's Cross S. Reh Co. 1-Tr 2, 330 fr wl 990 fr sl let or blk 42 and Sect 43, Pedro J. de Aguirre gt, 1010-ac lse, 6 mi n nw Crystal City.	1- 1-47	2-2 -47	3334	3303- 3334	Edwards li; L Cre	F 73; 1/16"	25.9		
		TEXAS DIST. 2 (MIDDLE GULF COAST)—New Oil Pay									
Victoria	Pridham Lke, W.	Fidelity O & R Co's Ed. Dietzel 1, 330 fr ne & sel 124.9-ac lse, R. Manchola gr.	2- 1-47	2-25-47	4973	2954- 2961		F 83; 1/2"	21.3		Some additional development expected.
		TEXAS DIST. 2 (MIDDLE GULF COAST)—Oil Field Extension									
Lavaca	Provident City	Shell's E. T. Neuhaus 2, 330 fr nel 1800 fr sel John W. Wynemaker sur, 1495-ac lse, 1½ mi nw extension.	12-20-46	1-31-47	8558	5402- 5412	Yegua sd; Eoc	F 132; 1/8"	46.2	Flt; sub	Additional development expected.
		TEXAS DIST. 2 (MIDDLE GULF COAST)—New Distillate Field									
Bee		Tom Slick's Fee 1-D, 467 fr nel 1457 fr sel lot 3, Butler Sbdn Wilson Reh, 300-ac "D" lse, J. Richardson sur, 1 mi nw Burnell-Wilcox fld, ½ mi ne ne Caesar's, S. fld.	12-18-46	1-15-47	6637	6524- 6526	Slick (Wilcox) sd; Eoc	No gge			Unimportant.
		TEXAS DIST. 2 (MIDDLE GULF COAST)—New Distillate Pay									
Live Oak	Clay West	Continental's Mrs. Clay West Burns 1-A, 660 fr nw & nel 166-ac "A" lse, 660 fr nwl 1980 fr swl Wesley Sellman sur.	9-14-46	2- 3-47	10275	9390- 9404	Wilcox sd; Eoc	F 78; 3 mln; 11/64"	40.6		Some additional development expected.
		TEXAS DIST. 2 (MIDDLE GULF COAST)—New Gas Pay									
Refugio	Huff	P. R. Rutherford et al's R. H. Morrow 1, 467 fr s & el 150-ac lse, 1450 w of el Ed. Perry sur.	12-29-46	2- 1-47	5666	4450- 4464		2.5 mln; 1/4"			Unimportant.
		TEXAS DIST. 3 (UPPER GULF COAST)—New Distillate Pay									
Colorado	Nada	Ohio Oil Co's Nada Unit 1-A, fr n/wly/nwc 768.7-ac lse go 1443 se alg swl th 1280 nely at ra, 600 s of nl of lse, Indianola RR Co.-J. D. Schulz sur, Sect 24.	7- 5-46	2-14-47	10336	9910- 9916		No gge	51.3		Well shut in. Unimportant.
		TEXAS DIST. 3 (UPPER GULF COAST)—Distillate Field Extensions									
Harris	Esperson D	Eli Mark's A. B. Cohn Est. 1, start nec 248-ac lse at Cedar Bayou 702.4 s 9° 10 min e to lcn, Meredith Duncan sur, ¾ mi w ext.	10-22-46	1- -47	9094	8687- 8695	Yegua sd; Eoc	No gge	50	SD	Shut-in; unimportant.
Liberty	Cleveland, W	Claude B. Hamill's Zoe B. MacDonald et al 1, 330 fr wl lot 50; 156 fr nl Devers sur, Liberty Acres Sbdn, 370.31-ac lse, 4800 w sw Gulf's MacDonald 2, gas well.	1-23-47	2-12-47	5779	5767- 5771	Yegua sd; Eoc	F 48; 2 mln; 1/4"	49	Flt; sub	Additional drilling in area expected.
		TEXAS DIST. 3 (UPPER GULF COAST)—New Gas Pays									
Colorado	Sublime	Tide Water's Guy F. Stovall 1, 660 fr sel 869.8 fr nel 140-ac lse, M. Muldron sur. 30.	12-16-46	2-28-47	9700	8029- 8049	Wilcox sd; Eoc	No gge		Flt	Shut-in; unimportant.
Wharton	Louise, N.	R. A. Johnston's S. G. Schrader 1, (OWWO) 467 fr n&wl 349.8-ac lse, Sect 40, J. A. Hamilton sur.	4-15-46	2-14-47	4449	4437- 4449	Frio; sd; Olig	2.5 mln; 1/4"			Unimportant.
		TEXAS DIST. 4 (LOWER GULF-SOUTHWEST)—New Oil Fields									
Jim Wells		Magnolia's David Clarke 1, 330 fr s&el 40-ac lse, Sect 62 R. P. Halderman Sbdn Seeligson Reh, 1 mi w Seligson fld, 1 mi sw Haldeman fld disc.	12-30-46	2-17-47	6505	4495- 4510	Frio sd; Olig	F 98; 1/8"	47.8	Flt	Will probably prove to be Seeligson fld extension.
Kenedy	McGill	Atlantic's H. F. McGill et al 1, 2500 e of wl sur 495, 39,200-ac lse, Sta. Rosa de Arriba gr.	9-15-46	2- 7-47	9905	7672- 7680		F 47; 68 wtr; 3/32"	46.2		Little additional development expected.
Starr	Kennard	Coastal Refineries-W. D. Kennard's Geo Coates-T. E. Vessels, Jr. 1, 330 fr n&el 69.11-ac lse and Tr 5, Porc 93, e Boyle fld, s Rincon fld.	1-27-47	2-25-47	4319	3870- 3882	Frio sd; Olig	F 38; 1/16"	45.6		Some additional development expected.
		TEXAS DIST. 4 (LOWER GULF-SOUTHWEST)—New Oil Pays									
Jim Wells	Magnolia, W.	R. E. Fair-Jack Woodward's Reynold's & Richardson 4-B, 1991 fr sly/nl 5210 fr el 1881-ac lse, nwc lot 24.	12-29-46	1-29-47	5834	4939- 4942	Frio sd; Olig	F 122; 11/64"	30.5		Important new sd for this new fld.
Kleberg	Borregas	Humble's King Reh-Borregas 7, 6900 n of sl 24,350-ac lse and Sta. Gertrudis gr.	11-29-46	2- 9-47	7960	7076- 7081	Frio sd; Olig	F 95; 1/8"	37.1		Good sd for this field.
		TEXAS DIST. 4 (LOWER GULF-SOUTHWEST)—New Distillate Field									
Jim Wells		H. J. Mosser-W.R. Quin's Chas. Muil 1, 467 fr n&el blk 47, L. G. Collins Farm lots 80-ac lse, Comanche Crk. Irr. Co. sur, 1½ mi w Alice fld.	10-25-46	2- 5-47	5517	5012- 5020	Frio sd; Olig	F 15; 2 mln; 3/8"		Probable sd lens	Unimportant.
		TEXAS DIST. 4 (LOWER GULF-SOUTHWEST)—New Distillate Pays									
Hidalgo	McAllen	Coastal Ref.-V. E. Cook-Chas. E. Thompson's Mrs. Zillah Hansen 1, 330 fr n&el lot 5, blk 13, Steele & Pershing Sbdn and 20-ac lse, Porc 67.	9-21-46	2- 9-47	11101	10090-10100		F 85; 1/16"	50.3	Flt Ant	Little additional development expected.
Jim Wells	Alice	Tom Graham's Trussell unit 1, 467 fr el 660 fr sl J. R. Trussell 106-ac Tr on 487-ac unit in sh 6, La Vaca gr, w flk of fld.	9- 3-46	1- 7-47	7809	4338- 4358	Frio sd; Olig	No gge; 1/16"		Str-trp	Little additional development expected.
Kleberg	Falfurrias, E	Shell's W. P. Wright 1, c lot 8, Sect 24, Burton & Danforth Sbdn Parrita Reh, Ramon de la Garza gr, 460.76-ac lse.	10-22-46	2-15-47	10310	9150- 9207	Vicksburg sd; Olig	F 95; 6.4 mln 3/8"	50.6		Some additional development expected.

New Oil, Distillate and Gas Fields and New Pay Horizons Discovered in the United States in February, 1947

Also Important Extensions to Established Fields

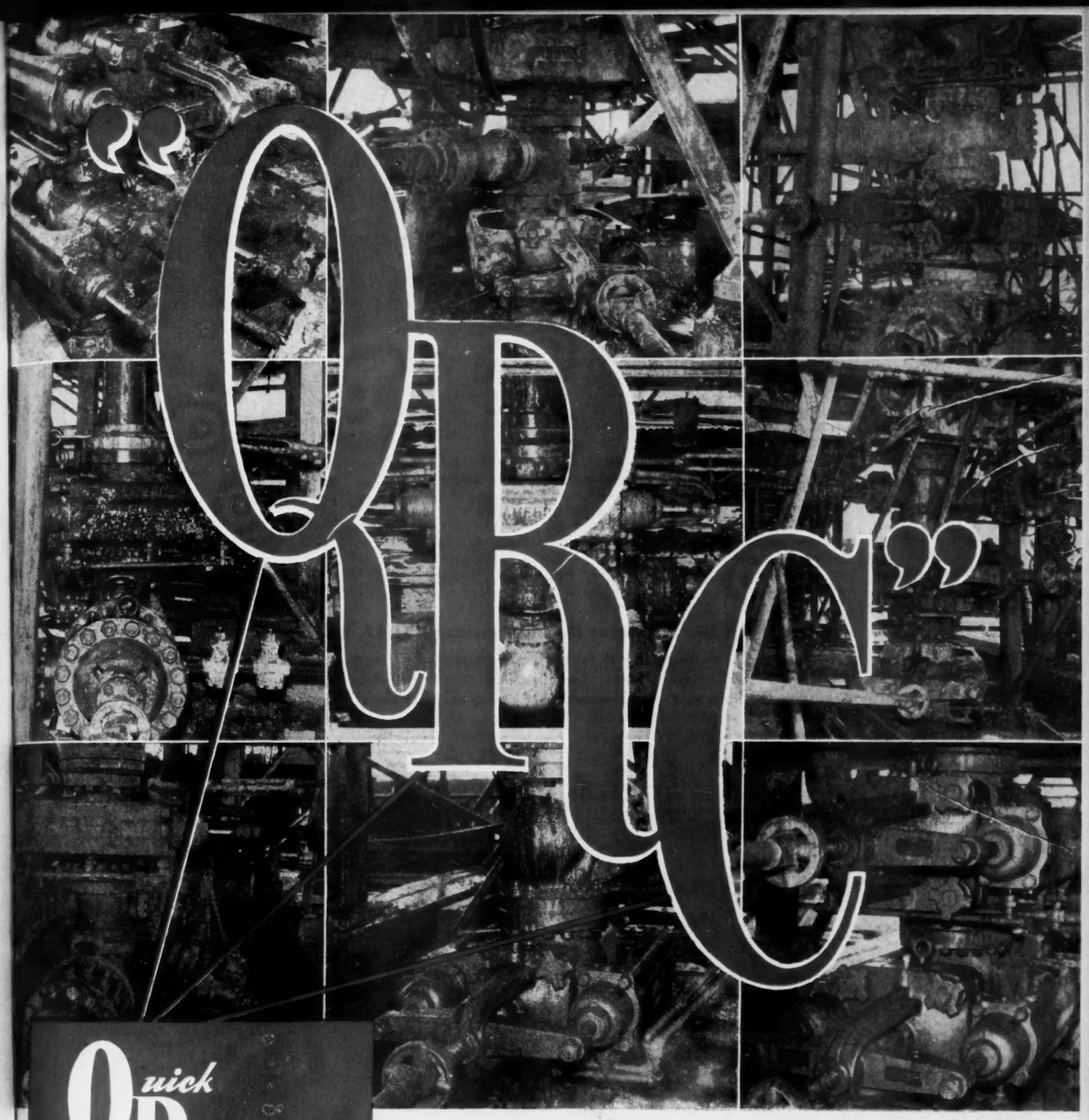
COUNTY	FIELD	COMPANY, WELL AND LOCATION	Date Spudded	Date Completed	Total Depth (Feet)	Completion Horizon (Feet)	[1]Name, Character and Age of Producing Formation	[2]Initial Production Method and Choke	Gravity of Oil	[3]Structure: [4]Method of Discovery	Tentative Evaluation of Discovery or Extension (Opinion of Relative Importance of Area from General Viewpoint of the Industry Based on Pertinent but Necessarily Incomplete Data: Later Development or More Complete Data Obviously Might Require Revision of this Tentative Opinion).
		TEXAS DIST. 4 (LOWER GULF-SOUTHWEST)—New Gas Pay									
Starr	Sun, N.	Sun's Lee M. Green 4, 789 fr sl 1146.71-ac lse, Sta. Teresa gr, 660 sw fr swc Andres Rojas 39.78-ac Tr.	1-10-47	2-25-47	6995	6470– 6480	Frio sd; Olig	F 2; 1.2 mln; 8/64"			
		TEXAS DIST. 7-B (N. CENTRAL)—New Oil Fields									
Fisher		Ellis A. Hall et al's J. D. Terrell 1-A, c nw sw H&TC Ry 80, blk 1, 1⅘ mi mi nw of prod.	9-22-46	2-14-47	4942	4900– 4935	Canyon li; Penn	F 307; ⅛"	40	Reef; geol	Small struct; high crude yld per acre.
Throck-morton		Fred M. Manning, Inc's Jas. R. Record 1, 2229 snl and 803 wel Sect. 1609, 3 mi e oil prod.	12-23-46	2-19-47	4700	4675– 4700	Mississippi li; Miss	F 360; 4/16"	45	Ant; geop	To be sml prod area, with attractive crude yld per acre.
		TEXAS DIST. 7-B (N. CENTRAL)—New Oil Pays									
Brown		Central Texas Gas Co's Frank Madison 1, 660 fr m/sly/sl and 660 fr m/ely/wl of Seth Ingram sur 154.	10-20-46	2- 1-47	2785	2755– 2778	Marble Falls li; Penn	P&F 57; 2"	40.5	Ant; geol	Small producing area for this zone.
Brown		G. C. English et al's F. H. Madison 1, 1585 snl and 950 wel Sbdn 10, Juan Delgado sur.	11- 1-46	2- 3-47	3400	2266– 2282	Bend li; Penn	F 99; ¼"	42	Ant; geol	Small producing area.
Fisher	Eskota	Skelly Oil Co's Pike Hall 1, 588 snl and 1402 ewl of 320-ac lse, G. W. Peck sur, 284, 1⅛ mi s by e 4400-ft prod.	10-31-46	2- 7-47	4783	2800– 2816	Saddle Creek li; Penn	P 8	36	Ant; geol	Structurally low for area.
Shackelford	Sanders	Allied Oil Co & Central Pipe Line Co's L. A. Sanders 1-C, 623 fr nwl and 706 fr swl Sect 583, TE&L Co sur, offsets Ellenburger prod.	11-21-46	2-17-47	4549	4424– 4434	Mississippi li; Miss	F 24; ¼"	41.8	Ant; geol	Sml area and to be erratic in performance.
Throck-morton		Goodstein & Gordon's O. H. Parratt-Edwards 3, 330 wel and 467 nsl Sect 955, TE&L Co sur, offsetting deeper prod.	1-21-47	2- 9-47	2612	2605– 2612	Strawn sd; Penn	F 150; ¼"	35	Ant; geol	Strawn prod covers sml area as determined by logs of nearby dpr wells.
		TEXAS DIST. 7-C (WEST CENTRAL)—Oil Field Extension									
Crockett	Shannon	Moore Exploration Co's A. C. Hoover 1-C, 838 snl and 2127 wel of Sect 4, blk FF, 1¼ mi sw ext.	5-14-46	1-28-47	2433	2394– 2433	San Andres li; Perm	P 35	31	Ant; geol	Intermediate acreage virtually proved for prod.
		TEXAS DIST. 8 (WEST)—New Oil Field									
Ector		Stanolind et al's Kayser Unit 1, c sw sw T&P Ry 34, blk 43, T-2-S, 1¼ mi mi sw Cowden, S. fld.	9-29-45	2-27-47	13620	8495– 8565	Pennsylvanian li; Penn	P 155; 4 wtr	33	Ant; geop	Prod not profitable; further dev nor probable.
		TEXAS DIST. 8 (WEST)—New Oil Pays									
Midland	Midland-Wolfcamp	Humble O & R Co's Mary Turner 1, 660 ewl and 1980 snl Sect 43, W. T. Holcombe sur, 2 mi s by e Midland pl, 10,390-ft Strawn disc.	7-15-46	2- 7-47	11445	8500– 8565	Wolfcamp li; Perm	P 139	40.1	Ant; geol-geop	Unprod in disc an atltho structurally favorable; plugged for pumper as compromise against dry hole. Unprofitable operation.
Ward	Spencer-Yates	John W. Murchison et al's Mollie Spencer-Texaco 1, 880 fr sel and 2200 fr nel H&TC Ry 53, blk 34, offsetting deeper prod.	11- 7-46	2-12-47	2780	2697– 2780	Yates sd; Perm	F 72; ¼"	34.4	Ant; geol	Production to be confined to small area.
		TEXAS DIST. 8 (WEST)—Oil Field Extension									
Hockley	Levelland	Stanolind O & G Co's S. S. Ripley 1, 660 out nwe Labor 20, Lge 72, Val Verde CSL, 1½ mi se ext.	11-24-46	2- 4-47	4876	4778– 4846	San Andres li; Perm	P 66; 8 wtr	31	Ant; geol	Flowed prior to deepening to wtr. Intermediate acreage proved. No failures in gen area.
		TEXAS DIST. 9 (NORTH)—New Oil Fields									
Archer		Jack L. Story et al's C. L. Abercrombie 1, 1900 snl and 1050 ewl blk 153, J. W. Harris Sbdn.	1-10-47	2-12-47	1236	1194– 1204	Gunsight li; Penn	P 27	38	Ant; geol	Nearby failures restrict prod limits to sml pl.
Archer		W. T. Graham et al's R. Campbell 1, (OWWO) 330 out of swc n½ BBB&C sur, A-36, 1¼ mi n shallow prod.	11- -46	2-19-47	5279	5060– 5100	Basal Bend li; Penn	P 35	40	Ant; geol	Drlg costs out of proportion to recovery.
		TEXAS DIST. 9 (NORTH)—New Oil Pays									
Cooke	Walnut Bend-Atkins	Sinclair Prairie Oil Co's N. P. Atkins 20, 420 snl and 1040 wel blk 59, Fannin CSL sur.	1- 8-47	2- 9-47	5690	5179– 5229	Strawn sd; Penn	F 616; 2"	35	Ant; geol	Logged effective pay at 5180-5248 previously indicated by dpr offset producers; involves lenticular sd and confined to sml area.
Cooke	Walnut Bend-Cox	Sinclair Prairie Oil Co's D. A. Cox 15-A, 1090 ns land 330 wel blk 59, Fannin CSL sur.	1- 8-47	2-10-47	3004	2993– 3004	Upr Strawn sd; Penn	F 273; ½"	39.6	Ant; geol	Shallowest pay; involves lenticular sd localizing prod for zone.
Jack	Wolfe-Strawn	Cox Drilling Co's Lee Easter 1, 480 snl 924 ewl of A. Benton sur A-37, ¼ mi e by s of Bend discovery.	12-11-46	2- 3-47	4891	3200– 3207	Strawn (Bryson) sd; Penn	F 204; 16 wtr ½"	40	Ant; geol	Involves lenticular sd pay possibly confined to flk of sml structure.
		TEXAS DIST. 9 (NORTH)—Oil Field Extension									
Archer	Burns-Benson	H. W. Snowden O & G Co's J. H. Turbeville 2 ,2200 snl and 330 ewl of J. B. Hinds sur, A-184, 1¼ mi ne extension.	11-16-46	2-12-47	4567	4553– 4567	Bend li; Penn	P 121	43	Ant; geol	Anticipated crude yld per ac low for cost of completions.
		TEXAS DIST. 10 (PANHANDLE)—New Oil Field									
Hale	Petersburg	Stanolind O & G Co's E. L. Fisher 1, c sw sw E. L. & R. R. Co, 5 blk CL, 19 mi e by n Irish pl.	11- 3-46	1-31-47	6992	6895– 6992	Pennsylvanian (Cisco) li; Penn	F 1342; 7/16"	39	Ant; geop	Import sweet oil disc on n end Permian Basin; 1st Penn prod for gen area; major drlg campaign may result.
		WYOMING—New Oil Fields									
Albany	Herrick Dome	Superior's Herrick 1, sw nw se 1-16n-76w, 10 mi e Quealy Dome fld.	10-31-46	2-24-47	3678	3630– 3678	Casper sd; Penn	P 360	21.1	Ant; sur	2nd recent disc in southern Laramie Basin in Casper form and as result considerable wildcatting probably will be done in area.
Washakie	Neiber Dome	G. & G. Drilling's Unit 1, se ne nw 19-45n-92w, 10 mi sw Worland.	11-14-45	1-22-47	10980	10025–10095	Embar li; Perm	F 281; 5 mln; 3/4"	42	D; sur-seis	Best of series of 4 structural tests in dp basin area of Big Horn Basin.

[1] Character of producing formations abbreviated thus: ch, chalk; dolo, dolomite; li, limestone; sd, sandstone; sh, shale; ser, serpentine; cgl, conglomerate. Ages of formations abbreviated thus: Pleis, Pleiocene; Plio, Pliocene; Mio, Miocene; Olig, Oligocene; Eoc, Eocene; U. Cre, Upper Cretaceous; L. Cre, Lower Cretaceous; Jur, Jurassic; Tri, Triassic; Perm, Permian; Penn, Pennsylvanian; U. Miss, Upper Mississippian; L. Miss, Lower Mississippian; Devo, Devonian; Sil, Silurian; Ord, Ordovician; Cam, Cambrian.

[2] Barrels of oil per day (24 hr. rate), flowing (F), pumping (P), swabbing (Sw), or bailing (B); or million cubic feet of gas daily open flow capacity; size of choke given in inches.

[3] Type structure abbreviated as follows: Ant, Anticline; D, Dome; Fld, Fold or Folded; Flt, Fault or Faulted; M, Monocline; N, Nose; SD, Salt Dome; Str trp, Stratigraphic trap; Syn, Syncline; Ter, Terrace.

[4] Method of discovery abbreviated as follows: cd, core drilling; dr, drilling; geol, geology; geop, geophysics; grv, gravity meter; ran dr, random drilling; seis, seismograph; sub, subsurface geology; sur, surface geology; tb, torsion balance.



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random drilling; seis, seismograph; sub, subsurface geology; sur, surface geology; tb, torsion balance.

Completions Gain Despite Shortages

TOTAL well completions in February topped January's mark and also showed considerable gain over February of last year. This increase helped bring the first two months' total to a point 2.6 percent higher than those of last year's comparable period.

Whether this year's drilling campaign can continue to hold or increase its lead over last year's is largely dependent on supplies of tubing. The most serious shortage the industry is now facing is that of well casing. This is not a new scarcity, but one that has been existent for some time along with drill pipe shortages. Supplies of drilling pipe have eased to where they are no longer a serious handicap, while the casing problem continues and even appears to be growing more difficult.

There were 2365 wells of all classes completed during February, an increase of nearly 100 wells over the 2267 wells finaled in January, and nearly 300 more than the 2066 wells in February of last year. Of these February wells, 369 were exploratory in nature, while the remaining 1996 were routine or field development wells. The overall total included 1225 oil, 28 distillate, 286 gas and 642 dry wells, and the remaining 184 were service wells and deepening jobs on old wells.

The total number of wells drilled in the first two months of this year was 4632 against 4514 in the same months of last year, an increase of 2.6 percent. Of this year's total 2357 were oil wells, 49 were distillate, 569 were gas and 1282 were dry holes. The remaining 375 were service wells, which included gas injection, water input and salt water disposal wells, and old wells drilled deeper.

Records for Texas drilling so far this year show 1295 wells completed against 1332 in last year's two months. This showed that Texas' activity was still 2.8 percent behind last year's operations. This was a bit unusual, because Texas generally is a fairly good index to the national drilling picture, due to its size and prominent part played in the country's oil and gas operations.

In the two months of 1947 there were 304 wells drilled in California compared with 312 in the same time a year ago, a drop of 2.6 percent. New Mexico upped its last year's total of 67 wells to 85 this year, for a gain of 27 percent.

[5]Well Completions in the United States During February, 1947, and Cumulative for Year

(Figures compiled from weekly reports of Oil Weekly staff, with following exceptions: Illinois from Illinois Geological Survey; Indiana from Indiana Division of Geology; Missouri from Missouri Geological Survey; Tennessee from Tennessee Division of Geology; Bradford, Kane-Clarendon, and Allegany fields of Pennsylvania and New York from The Producer's Monthly.)

STATE OR DISTRICT	MONTHLY COMPLETIONS, February, 1947									Total Completions				CUMULATIVE TOTAL January-February				Rigs in Operation		
	New Wells								Total Drilled Deeper											
	Oil	Dist.	Gas	Dry	Water Input	Gas Input	Water Disposal	Total New		Feb., 1947	Jan., 1947	Feb., 1946	Footage February, 1947	Wells 1947	Wells 1946	Percent Diff.	Footage, 1947	Feb. 28, 1947	Jan. 31, 1947	Feb. 28, 1946
Alabama	1			2				3		3			9,173	3	3		9,173	3	7	4
Arizona																		2		
Arkansas	8		[1]	4				13		13	17	16	55,491	30	31	— 3.2	122,61[0]	31	35	26
California	122		[2]	25				149	6	155	149	116	657,434	304	312	— 2.6	1,269,739	309	293	304
Colorado	7			4				11		11	9	7	55,614	20	18	+ 11.1	114,237	46	54	62
Florida				4				4		4	3	1	17,873	7	4	+ 75.0	30,297	6	10	8
Georgia																		1	1	1
Illinois	80			50				130	2	132	147	137	327,980	279	290	— 3.8	692,991	229	232	262
Indiana	23		5	18				46		46	34	19	74,429	80	46	+ 73.9	136,188	75	63	77
Iowa																			1	
Kansas	95		47	65			2	209	2	212	171	153	682,197	383	357	+ 7.3	1,240,267	327	356	264
Kentucky	14		20	19				53	1	54	56	37	97,732	110	88	+ 25.0	198,401	100	96	57
Louisiana	51	6	5	30				92	1	93	110	90	537,376	203	201	+ 1.0	1,275,403	146	145	209
North Louisiana	23	2	5	19				49		49	55	42	165,230	104	102	+ 2.0	392,360	49	51	97
South Louisiana	28	4		11				43	1	44	55	48	372,146	99	99		883,043	97	94	112
Michigan	14			16				30		30	40	65	63,909	70	124	— 43.5	156,994	129	105	116
Mississippi	14	1	1	5				21		21	26	12	186,463	47	35	+ 34.3	389,874	70	60	38
Missouri	1			3				4		4	10	2	4,374	14	3	+366.7	7,924		1	7
Montana	1		1	1				3		3	9	15	7,900	12	43	— 72.1	30,436	37	43	68
Nebraska																		6	2	5
New Mexico	25		6	7				38	5	43	42	28	168,437	85	67	+ 26.9	342,272	110	102	84
New York	51				29			80		80	88	71	107,514	168	146	+ 15.1	231,876	101	102	79
North Carolina																		1	1	
Ohio	17		41	20				78	1	79	121	79	242,951	200	174	+ 14.9	607,809	232	239	224
Oklahoma	169	1	15	110				295	8	303	271	209	899,669	574	449	+ 27.8	1,762,615	484	502	441
Pennsylvania	104		45	19	86	24		278	1	279	298	324	484,240	577	648	— 11.0	1,002,673	371	365	416
South Dakota																			1	7
Tennessee															1	—100.0		10	10	4
Texas	413	20	43	222	1			700	11	711	584	612	3,104,071	1,295	1,332	— 2.8	5,720,668	1,134	1,133	1,082
Dist. 1 S. Central	17		3	12				32		32	22	10	103,514	54	18	+200.0	169,961	28	32	31
Dist. 2. Middle Gulf	30	7	2	12				51	2	53	33	[1]	311,891	92	[1]	[1]	538,185	43	[1]	[1]
Dist. 3. Upper Gulf	29	6	5	15				55		55	60	63	386,282	115	118	— 2.5	806,065	87	77	94
Dist. 4 L. Gulf-SW	51	7	10	29				97	1	98	63	117	545,199	161	248	+ 2.0	879,518	108	133	142
Dist. 5 East Central	1			6				7		7	9	[2]	36,929	16	[2]	[2]	61,033	25	[2]	[2]
Dist. 6 Northeast	19		4	9				32		32	38	47	147,402	70	108	— 20.4	341,411	73	89	111
Dist. 7-B N. Central	35		2	36				73		73	54	[3]	242,197	127	[3]	[3]	390,114	124	[3]	[3]
Dist. 7-C West Central	18			4				22	1	23	7	[4]	94,643	30	[4]	[4]	120,248	71	[4]	[4]
Dist. 8 West	114		1	18				133	6	139	127	176	672,120	266	387	— 23.5	1,355,740	324	495	446
Dist. 9 North	83			79	1	1		164	1	165	129	157	449,356	294	367	+ 14.7	820,999	140	201	188
Dist. 10 Panhandle	16		16	2				34		34	36	42	114,538	70	86	— 18.6	237,394	111	106	70
Utah												1			1	—100.0		6	5	7
Washington																		1	1	
West Virginia	4		54	14				72	2	74	62	43	216,128	133	113	+ 20.4	393,400	380	372	395
Wyoming	11			4				15		15	20	13	76,311	35	28	+ 25.0	172,829	55	53	86
Total U. S.	1,225	28	286	642	116	25	2	2,324	41	2,365	2,267	2,041	8,077,272	4,632	4,514	+ 2.6	15,908,678	4,402	4,390	4,333

[1] Dist. 2 included with Dist. 4. [2] Dist. 5 included with Dist. 6. [3] Dist. 7-B included with Dist. 9. [4] Dist. 7-C included with Dist. 8. [5] Effective with data for September, 1946, figures are on calendar month basis. Previously all statistics were for 4-week and 5-week months, explained when published.

Crude Yield Up; Refinery Output Off; Gasoline Stocks Reflect Brisk Demand

Crude production was increased during the week ended March 22, but refinery output of most principal products was cut back, according to The API. Gasoline stocks apparently reached their peak during the previous week and began to reflect the increasing demands of the season.

Daily crude production in the week of March 22 averaged 4,862,000 barrels, an increase of 17,000 barrels a day over the previous week's daily rate. This daily output was 431,000 barrels or 9.7 percent more than was produced daily in the like week of last year.

Runs to refinery stills during the week averaged 4,885,000 barrels a day, a decrease of 101,000 barrels from the previous week's daily runs. However, this week's runs topped those of last year's week by 195,000 barrels or 4.2 percent.

Stocks of refinable crude totaled 222,341,000 barrels on March 15, according to the Bureau of Mines. That total was 1,338,000 barrels less than it had been a week previously, and 3,892,000 barrels less than a year before.

A drop of 685,000 barrels from the previous week's gasoline production brought the week's output down to 14,440,000 barrels, which was 1,190,000 barrels or 9 percent more than was produced in the like week a year ago. The downward turn in gasoline stocks began during the week when stocks were reduced 287,000 barrels, leaving them totaling 106,526,000 barrels at the week's end. A week before they had totaled 106,813,000 barrels, the peak which was 1,580,000 barrels higher, and was reached a month later, than last year's high mark. Those stocks of finished and unfinished gasoline held on March 22 were 2,196,000 barrels or 2.1 percent higher than the inventory of March 23 of last year.

The week's output of distillate fuel oil increased 943,000 barrels over the previous week's production to total 5,968,000 barrels. That amount was 324,000 barrels or 5.7 percent more than was produced in the comparable period of last year. Demand for this domestic heating oil continued to be heavy during the week and caused the withdrawal of 1,391,000 barrels from stocks, which were reduced to 32,993,000 barrels. That total was 5,218,000 barrels or 18.8 percent higher than the amount in storage a year before.

Production of residual fuel amounted to 8,621,000 barrels in the week, a decrease of 295,000 barrels from the previous week's output, but 152,000 barrels or 1.8 percent over that of the like week of last year. Stocks of residual were lowered 1,031,000 barrels to 42,703,000 barrels, which were 4,850,000 barrels or 12.8 percent higher than a year ago.

Crude Prices Generally Firm; Refined Products Hikes Made

A price increase for Corning (Ohio) crude, announced by the South Penn Oil Company, comprised the week's crude price activity, while raises in refined products prices were reported in several areas.

Joseph Seep Purchasing Agency of the South Penn Oil Company announced it would pay an increase of 34 cents per barrel for Corning crude in the Buckeye lines, effective March 24. This hike brings the company's posting for this crude to $2.35 per barrel. The last change in price for Corning crude was a 25-cent increase to $2.01 a barrel on March 10.

Higher prices for gasoline, kerosine and light fuels were general for points south of Savannah at the beginning of the week. At Savannah, Jacksonville, Miami and Tampa, 74-76 octane gasoline was posted at 9.4 cents, Ethyl at 10.4, kerosine at 8.1, and No. 2 fuel oil at 7.3 cents.

Prices of most refined products in North Texas were up following a .2-cent advance in gasoline and kerosine prices by one refiner, and a second refiner's report of a 10-cent increase to $1.65 for No. 6 fuel oil. Ethyl and regular-grade gasoline were priced higher in East Texas when a refiner announced a .25-cent advance in truck transport quotations.

On the Gulf Coast, aviation and "no jump" 74-76 octane gasolines were priced higher for cargo lots with .125 to .5-cent per gallon advances in quotations reported by two large suppliers.

Prices for most refined products in Pennsylvania were reported unchanged, but refiners were preparing to make upward revisions in their light product schedules. One refiner in the lower fields of Pennsylvania was reported to have increased his price for regular-grade gasoline from 8 to 8.75 cents, kerosine from 8 to 8.25, No. 1 fuel oil from 7.5 to 7.75 and No. 2 fuel oil from 7.25 to 7.5 cents.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Crude Oil Prod. Week Ended	Runs to Stills Barrels Daily	Runs to Stills Week Ended	Crude Stocks Barrels	Crude Stocks Week Ended	Gasoline Stocks Barrels	Gasoline Stocks Week Ended	Gasoil and Distillate Stocks Barrels	Gasoil and Distillate Stocks Week Ended	Residual Fuel Oil Stocks Barrels	Residual Fuel Oil Stocks Week Ended
Highs:												
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	47,861	11-14	95,857	1- 8
1945	4,944	7-21	[5]5,140	8-18	227,554	10-13	99,012	3-24	45,341	11-17	56,074	1- 6
1946	[4]4,961	6-15	4,968	12-28	229,430	3- 2	105,233	2-16	[1]67,286	11- 9	61,636	11- 2
1947	4,862	3-22	4,986	3-15	225,131	3- 1	106,813	3-15	58,034	1- 4	53,285	1- 4
Lows:												
1945	3,621	10- 6	3,409	10- 6	[2]211,813	8-25	70,791	10-13	26,483	3-17	38,548	5-26
1946	4,403	3- 9	4,498	1-12	218,193	1- 5	85,324	9-28	25,131	3- 9	37,289	4- 6
1947	4,531	1-11	4,737	2-15	220,313	2- 8	94,882	1- 4	32,993	3-22	42,703	3-22

TRENDS OF 1946 AND 1947

Trends in Week Ended	Crude Oil Production Daily	Crude Oil Runs to Stills Daily	Crude Oil Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1946:									
January 5	4,548	4,651	218,193	14,488	98,494	5,923	35,199	8,867	42,371
January 26	4,626	4,553	220,544	13,622	101,737	5,720	29,498	8,411	39,722
February 23	4,714	4,595	226,699	13,175	104,709	5,728	25,398	7,913	39,290
March 30	4,425	4,684	224,994	13,896	104,715	5,337	28,240	8,738	37,746
April 27	4,672	4,685	224,443	14,228	99,631	5,568	30,466	9,204	39,404
May 25	4,759	4,857	222,214	14,312	95,769	5,463	32,973	8,908	43,368
June 29	4,957	4,854	223,883	14,500	92,333	5,325	37,762	8,828	46,477
July 27	4,926	4,896	223,756	14,535	88,626	5,817	44,316	8,217	49,517
August 31	4,833	4,911	227,132	15,014	87,217	5,630	53,134	8,539	53,173
September 28	4,778	4,829	223,043	14,675	85,324	5,632	59,827	8,172	57,657
October 26	4,730	4,758	221,184	14,863	86,423	5,710	65,499	7,728	60,872
November 30	4,795	4,707	227,693	15,145	88,371	5,258	66,062	7,672	58,647
December 28	4,713	4,968	226,995	15,604	93,126	5,931	58,941	8,181	53,427
1947:									
January 4	4,649	4,917	223,291	15,281	94,882	5,857	58,034	8,375	53,285
January 25	4,672	4,820	221,655	14,624	99,801	5,630	50,357	8,224	48,558
February 22	4,786	4,860	224,580	14,668	103,904	5,929	40,739	8,542	44,919
March 1	4,771	4,896	225,131	15,191	105,803	5,488	38,004	8,824	45,175
March 8	4,824	4,925	223,679	14,782	106,418	5,572	36,601	8,496	44,202
March 15	4,845	4,986	222,341	15,125	106,813	5,025	34,384	8,916	43,734
March 22, 1947	**4,862**	**4,885**	.....	**14,440**	**106,526**	**5,968**	**32,993**	**8,621**	**42,703**
March 23, 1946	4,431	4,690	[3]226,233	13,250	104,330	5,644	27,775	8,469	37,853
Change:									
In Week	+17	—101	—1,338	—685	—287	+943	—1,391	—295	—1,031
In Year	+431	+195	—3,892	+1,190	+2,196	+324	+5,218	+152	+4,850
In Year	+9.7%	+4.2%	—1.7%	+9.0%	+2.1%	+5.7%	+18.8%	+1.8%	+12.8%

[1] All time peak. [2] Lowest since December, 1921. [3] Stocks, March 16, 1946.

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• Oklahoma

Oil Pools Opened in Garvin And Okfuskee Counties

Garvin County wildcat opens oil pool; pool opened in Okfuskee County; Ohio opens producing zone in Carter-Knox field; McClain County well may open oil pool; Cimarron County wildcat to try for oil production; deepest test fishing for tools.

Garvin County: A wildcat 1½ miles southwest of Pauls Valley has opened the 15th oil pool in western Garvin County. A. R. McElreath et al's Barnett 1, NW NE SW 24-3n-1w, has production from the Simpson sand at 4050-57 feet. The test flowed 20 barrels of oil per hour with 2½ million cubic feet of gas a day and casing was being set at 4054 feet to shut off the gas zone. Pennsylvanian formation was based at 4043 feet and the Simpson was topped at 4050 feet. On a previous drill-stem test at 4043-50 feet, the well made 5 million cubic feet of gas per day. The test has opened the 20th pool in the fast-moving Garvin-McClain area, and the 28th producing zone in this area. Most of the fields have been discovered in the last 14 months.

Okfuskee County: An oil pool has been opened by Tom Berry's Palmer 1, SW SW SW 11-12n-8e, northeast of Boley and a mile south of production in the Valley Grove area. The Palmer topped Cromwell sand at 3748 feet, and on a drill-stem test at 3750-60 feet, total depth, 3200 feet of oil was recovered. The well made a steady blow of gas during the 40-minute test. Crew ran 5½-inch casing at 3750 feet. The test is in the next range east of Okfuskee County's 2-zone Garden Grove pool, southwest of Paden.

Grady County: A new pay zone has been opened on the west flank of the old Carter-Knox field by The Ohio Oil Company's Woods 1, NE SW NE 17-3n-5w. The test recovered 1320 feet of 41-gravity oil and 30 feet of oil- and gas-cut mud in the tester on a drill-stem test of the Dornick Hills sand at 3480-509 feet, and crew was coring ahead and will make another drill-stem test at a deeper zone before the well is completed.

McClain County: A wildcat southwest of Purcell townsite promises to be an oil pool opener. Big Chief Drilling Company's Sasser 1, NW SE NW 30-6n-2w, recovered free oil and oil-cut mud on a drill-stem test in the Hunton lime and was drilling at 7830 feet in the formation before attempting to bring the well into commercial production in that zone. Gas, estimated at 50,000 cubic feet per day, showed in 32 minutes on the test.

Cimarron County: An attempt to find oil production in western Cimarron County, in the Panhandle, will be made by The Texas Company at Nance & Hall 1, CNE SW 29-2n-3eCm. The test, southwest of Boise City, will be taken to 6000 feet. The venture is on a block covering what is known as the R. C. C. Thatcher Ranch. Only oil production in the county is a small area in the Keyes district.

Caddo County: Crew continued to cut drill pipe at The Superior Oil Company of California's Weller 51-11, NW NW NE 11-8n-12w, near Fort Cobb. The wildcat is bottomed at 17,236 feet. Pipe became stuck 25 feet off bottom and crew is cutting pipe 300 feet off bottom after all efforts to free it failed. If fishing is unsuccessful, crew probably will set whipstock and bypass the pipe.

• Kansas

Rooks County Wildcat Opens Oil Pool Near Webster Area

Rooks County wildcat opens oil pool northeast of Webster pool; Trego County gets oil pool; Burnett Northwest pool extended southeast.

Rooks County: A oil pool has been opened 5 miles northeast of the Webster pool by Phil-Han Oil Company and associates. Veverka 1, SE SE SE 7-8s-18w, recovered 30 feet of free oil and 95 feet of oily drilling fluid on a drill-stem test in the Arbuckle lime, 3405-13 feet. Crew set 5½-inch casing at 3405 feet and will continue testing. The test reportedly has been low on structure in all formations topped. A 7-foot saturated core was recovered in the zone before the 27-minute drill-stem test was taken.

Trego County: An oil pool apparently has been opened a mile east of the 1-well Cotton pool in an area generally neglected after poor showings in other wildcats. Continental Oil Company's Cotton 1, SE SE NW 14-12s-21w, showed 120 feet of oil on 60-minute drill-stem at 4992-60 feet in the Arbuckle lime. The well is the 53rd stratigraphic test the company has started in the area, and the fifth hole to develop a new pool. The other pools opened by the company were the Barry, Kriley and Hobart, all in Rooks County, and the Alda in Graham County.

Ellis County: Midstates Oil Corporation has extended the Burnett Northwest pool ½ mile south with the Myrtle Croswell 1, NW NE SW 2-11s-18w. A 2400-foot fillup was reported in 40 minutes on a test in the Arbuckle lime from 3526-37 feet, total depth. Crew acidized with 500 gallons to clean up the hole so more extensive testing might be made.

Illinois Properties Sold

Shell Oil Company, Tulsa, has purchased the Adkins Oil Associates, oil-producing partnership of Tulsa and Benton, Ill. Consideration has been estimated at approximately $3 million. The sale involves 96 producing wells near Benton in Franklin County, Ill., with a daily gross crude production of 1100 barrels.

Wells Completed in the United States in Week Ended March 22, 1947

Data preliminary and subject to revision. Revised and more complete data on all completions and exploration shown in monthly summaries published in last issue of each month.

State or District	FIELD COMPLETIONS: New Wells: Oil	Dist.	Gas	*Input	Dry	Total	Old Wells Deepened	EXPLORATORY COMPLETIONS: Oil	Dist.	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	This Week 1945
Alabama	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Arkansas	...	...	...	...	...	...	...	...	...	...	1	1	1	7	4
California	21	...	1	...	2	24	...	...	...	...	9	9	33	42	45
Colorado	4	...	...	...	...	4	...	...	...	...	...	...	4	2	2
Florida	...	...	...	...	...	...	...	...	...	...	1	1	1	...	...
Georgia	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...
Illinois	20	...	...	...	6	26	...	...	...	...	5	5	31	34	36
Indiana	3	...	3	...	2	8	...	...	...	...	2	2	10	13	7
Kansas	21	...	11	1	11	44	4	...	...	...	8	8	56	36	37
Kentucky	2	...	2	...	2	6	...	...	...	...	2	2	8	10	13
Louisiana	6	2	2	...	1	11	...	...	2	...	3	5	16	19	32
N. Louisiana	4	...	2	...	...	6	...	...	...	...	2	2	8	11	12
S. Louisiana	2	2	...	...	1	5	...	...	2	...	1	3	8	8	20
Michigan	3	...	1	...	...	4	...	...	...	...	...	...	4	11	9
Mississippi	6	...	...	...	...	6	...	...	...	...	1	1	7	8	6
Montana	1	...	...	...	...	1	...	...	...	...	...	...	1	1	4
New Mexico	17	...	2	...	...	19	3	1	...	...	1	2	24	5	13
New York	12	...	...	8	...	20	...	...	...	...	...	...	20	24	25
North Carolina	...	...	...	...	...	...	...	...	...	...	1	1	1	...	...
Ohio	6	...	14	...	4	24	...	...	...	...	1	1	25	18	24
Oklahoma	26	...	1	...	14	41	...	1	...	...	15	16	57	83	52
Pennsylvania	30	...	4	12	2	48	1	...	...	...	...	...	49	42	50
Texas	106	...	13	...	22	141	3	6	...	1	23	30	174	163	140
Districts:															
1. S. Central	2	...	...	...	...	2	....	1	...	...	2	3	5	11	8
2. Middle Gulf	7	...	...	...	1	8	...	2	...	...	6	8	16	13	[1]
3. Upper Gulf	13	...	...	...	1	14	...	1	...	...	...	1	15	15	12
4. L. Gulf-S.W.	14	...	...	...	...	14	...	...	...	...	7	7	21	25	18
5. E. Central	1	...	...	...	...	1	...	...	...	...	...	...	1	2	[2]
6. Northeast	4	...	2	...	...	6	...	...	...	...	...	...	6	9	13
7-B. N. Central	6	...	2	...	5	13	...	...	...	...	2	2	15	3	[3]
7-C. W. Central	4	...	...	...	2	6	...	...	...	...	...	...	6	5	[4]
8. West	26	...	...	...	3	29	3	1	...	...	1	2	34	29	38
9. North	26	...	...	...	8	34	...	1	...	1	5	7	41	40	42
10. Panhandle	3	...	9	...	2	14	...	...	...	...	...	...	14	11	9
West Virginia	1	...	8	...	3	12	...	...	...	...	...	...	12	14	13
Wyoming	...	...	1	...	...	1	...	...	...	...	...	...	1	5	1
Total U.S.	285	2	63	21	69	440	11	8	2	1	73	84	535	538	514

* Includes salt water disposal wells. [1] Middle Gulf included with Lower Gulf-S.W. [2] East Central included with Northeast. [3] N. Central included with North. [4] West Central included with west.

• New Mexico

Third Well in Lea County's Strawn Area Has Good Flow

Third well in Lea County's single Strawn producing area registers unusually large oil flow; Ellenburger pay in Brunson field extended south and defined to the west.

Lea County: Continental Oil Company et al's Skaggs 5-B-23, SW NE 23-20s-37e, ½ mile east of the Strawn-pay discovery for the Cass field, scored the largest producer listed for New Mexico in some years in flowing 4944 barrels of 42-gravity oil, with gas-oil ratio of 153/1, on potential through 1-inch choke after using 500 gallons of acid. Production is from perforations at 7710-20 feet in Strawn, topped at 7710 feet with elevation 3539 feet. The potential was based on 3-hour gauge. This well correlates comparatively flat with nearby wells to the Pennsylvanian beds, then registered considerable relief on the Devonian, Silurian, Montoya and Simpson zones. It is bottomed at 10,231 feet in granite, which correlates 200 feet high to the discovery, which also failed to encounter Ellenburger. The Atlantic Refining Company, Standard Oil Company of Texas and Stanolind Oil & Gas Company each has ¼ interest in the well and a large supporting block of leases.

Amerada Petroleum Corporation's Walden 1, NE SW 15-22s-37e, ½ mile south by west of a south extension Ellenburger producer for the Brunson field, entered the Ellenburger at 7690 feet, with elevation 3402 feet, and was drilling pay at 7825 feet. It will continue to granite before setting pipe for completion. Top of the Ellenburger correlates 353 feet low to the nearest Ellenburger well, which had a short section due to entering granite at 7570 feet. The new extension paves the way for considerable new development. This Ellenburger area affords a high crude yield per acre, and since the oil is sweet the price commanded is $1.95 per barrel.

Amerada's Hare 4, SE SW 33-21s-37e, previously listed as a northwest extension for the Brunson field, flowed 398 barrels of 41-gravity oil on 9-hour gauge through ½-inch choke after using 500 gallons of mud acid through perforations at 7900-28 feet in Ellenburger, topped at 7680 feet. The upper section of the thick pay will be perforated in later years.

Gulf Oil Corporation's Baker 3, NE SE 5-22s-37e, ½ mile west of Ellenburger production in the Brunson field, plugged back from 8291 feet in Ellenburger, topped at 8216 feet with elevation of 3439 feet, to try for production after testing oil, gas and water when tester was used at 8219-41 feet. This outpost reveals the steepness of the west dip of the Ellenburger beds.

• West Texas

Crockett Wildcat Controlled After Flowing Oil, Gas, Water

Crockett County wildcat controlled after flowing oil, gas and water; Dollar Hide field extended northwest; new Ellenburger test assigned high point of the Goldsmith structure; Coke County's Crinoidal oil area fails to produce from Ellenburger.

Crockett County: Cities Service Oil Company-Plymouth Oil Company and Humble Oil & Refining Company's Owens 1-B, C SW NW H&OB 6, Block GG, 1¼ miles northwest of the Clara Couch shallow field, improved its outlook of becoming an important discovery in flowing wild due to clogged and stuck drill pipe at 5804 feet. The well is credited with flowing 60 to 100 barrels of oil and a small amount of sulphur water hourly, with gas volume rated at 15 million cubic feet daily, while at the 5804-foot level. Drill-pipe was perforated to restore circulation and kill the flow with mud, but fishing was still in progress. This prospect was originally credited with having entered the Crinoidal lime, which yields high-gravity sweet crude in the Todd and Jameson fields, at the 5615-foot level. Revised interpretation of formation samples place the Wolfcamp-Cisco (Pennsylvanian) contact at 5618 feet, with elevation 2410 feet. Deep rights in the general area have been in demand for several years on the strength of a large structure being outlined by subsurface and geophysics. Owners of the well are drilling on a 41-acre site, but did not pool their adjacent leases. Plans are to continue to the Ellenburger as originally planned.

Coke County: Sun Oil Company's Fred Jameson 1, south offset to its Jameson field Crinoidal (Pennsylvanian) lime discovery at 6224-45 feet, tested water in Ellenburger open hole at 7045-7130 feet, and was preparing to complete from about 180 feet of effective oil and gas pay in the Crinoidal, topped at 6126 feet. Preliminary test of the lower section of the Crinoidal from perforations at 6454-56 feet yielded 1260 feet of oil-and water-cut mud, averaging 50 percent oil. The interval between the Crinoidal and Ellenburger has been tentatively classed as Pennsylvanian, but the Mississippian may have been reached at 6860 feet.

Andrews County: Magnolia Petroleum Company's Cowden 1-C, C NE SE PSL 5, Block A-55, extended the Dollar Hide field ⅜ mile northwest in flowing 390 barrels of 40.5-gravity oil natural through ¼-inch choke on potential gauge from open hole at 7920-52 feet in Devonian, topped at 7920 feet. Magnolia is starting Cowden 2-C, a south offset, as an Ellenburger test, while The Pure Oil Company's Cowden 1, C SE SW PSL 24, Block A-52, will try for a north extension. This area has 9 Devonian and a Silurian producer.

Ector County: Gulf Oil Corporation is starting Goldsmith 430-E, SE NW T&P 15, Block 44, and ¾ mile northwest of its deep test awaiting completion in the Devonian, to make a second try for Ellenburger production near the apex of the Goldsmith field. Phillips Petroleum Company's TXL 1-M, 1¼ miles west of the field's Permian production, tested dry in Devonian at 8685-725 feet, and was drilling lime at 8795 feet.

Yoakum County: The Texas Company's Samuels 1, C NE NW Sect. 242, Block D, isolated wildcat, cemented pipe on bottom of 5330 feet to test possible saturation near the 5200-foot level in San Andres, topped at 4510 feet with elevation of 3804 feet.

Wildcats: George Livermore, Inc.'s Moore-Texaco 1, Hockley County, and Palmer Oil Corporation's Oates 1, Tom Green County, were abandoned at 4837 feet and 5846 feet, respectively. In Crosby County, Humble's Montgomery 1, Ellenburger prospect, tested water at 5226-334 feet, and was drilling shale at 5880 feet. The Texas Company's Connell 31, Crane County Ellenburger test, was drilling lime at 5920 feet. Favorable showings were passed up in the Glorietta and 2 zones in the Cleark Fork, but each was accompanied by water.

Winkler County: Ellenburger wells in the Keystone field were due to be cut back to 27,500 barrels daily allowable, or 208 barrels per well daily, on April 1 as a protective measure against rapidly receding reservoir pressure and spread of the water table in the thin pay sector of the structure. Large percentage of the recent completions has been at structurally low points and the edge of the producing area. This Ellenburger oil is of premium quality due to its lube content.

• North Texas

Cooke County Test Is Flowing Completion from Ellenburger

Southwestern Cooke County core test makes flowing completion from Ellenburger; Haskell County pool has new oil pay; Mississippi discovery made in Jack County; Montague County wildcat has oil show in Strawn.

Cooke County: Phillips Petroleum Company's L. M. Atcheson 1, Jackson Davis Survey A-331, 2 miles southwest of Hood and the same distance southeast of production, registered a potential of 643 barrels of 42-gravity oil, with gas-oil ratio of 117/1, through 32/64-inch choke after acidizing perforations at 1936-82 feet. The Ellenburger was entered at 1936 feet, with elevation 915 feet, and base of the pay was called at 1995 feet. The company was core drilling its 695½-acre lease to the Ellenburger when production was encountered. Sinclair Refining Company's trunk line cuts across the lease, and will connect.

Haskell County: Thos. D. Humphrey's Chapman 3, Block 60, H. Tidwell Survey and 1023 feet south of his Strawn lime oil discovery at 4070-82 feet, confirmed production for deeper sand in the Strawn at 4228-68 feet in swabbing 6 barrels of oil hourly with nominal show of water. It will be placed on the pump.

Jack County: Thos. E. Berry and Hill & Hill's Clayton 1, L. Knight Survey A-424, and 1900 feet west by north of a 4671-foot Marble Falls oil-pay discovery for the Bryson area, confirmed earlier indication of establishing production from the Mississippian in flowing 20 barrels of 44-gravity oil natural per hour through ¼-inch choke from open hole at 5120-58 feet. The Mississippian was entered at 5073 feet, with maximum porosity at 5124-49 feet. Mullendore, Berry & Berry have rigged up to drill a west offset.

Montague County: Continental Oil Company's Magee 1, C. A. Wright Survey A-1052 and 3 miles southeast of Montague, entered the Bend at 6245 feet, with elevation 1058 feet, and was drilling lime at 6255 feet. This wildcat logged oil-saturated sand in the Strawn at 6028-45 feet, and a drill-stem test at 6024-33

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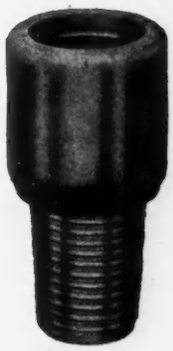

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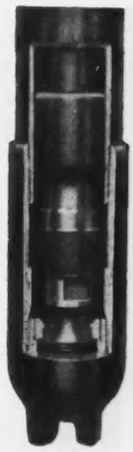

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feet yielded gas to the surface in 55 minutes, while the recovery consisted of 420 feet of oil- and gas-cut mud, involving about 50 percent high-gravity oil. Pay below this test was not tested.

Throckmorton County: Fred M. Manning, Inc.'s Brown 1, northwest corner of Sect. 919, TE&L Co. Survey, and ⅓ mile northeast of the firm's Mississippi oil-pay discovery on the Record geophysical prospect, was flowing oil and water on preliminary test after using acid in open hole at 4686-4706 feet. Brown 1 is about 30 feet low to the discovery, but indicated commercial production from the Bend, topped at 4133 feet, with elevation of 1332 feet.

Eastern District API Plans Spring Meeting

The Eastern District, Division of Production, of the American Petroleum Institute has announced its program for the spring meeting at the William Penn Hotel, Pittsburgh, April 16, 17 and 18. Papers scheduled include:

"A National Oil Policy and Its Effects on the Domestic Petroleum Industries," B. A. Hardey, president, Independent Petroleum Association of America, Shreveport, La.

"Progressive Public Relations Program for the Progressive Petroleum Industry," Franklyn Waltman, Public Relations Department, Sun Oil Company, Philadelphia.

"Recent Advances in the Problem of Oil Origin," William Hanson, Senior Fellow, Mellon Institute, Pittsburgh.

"Water-Flooding Research Is Essential," David Scott, Ryder-Scott Company, Bradford, Pa.

"Connate and Drilling Water Saturation of Baker Cores," A. P. Clark, South Penn Oil Company, Bradford, Pa.

"Recent Advances in Selective Exclusion of Water in Input Wells," Don Martin, Hercules Powder Company, Wilmington, Del.; Kurt H. Andresen, South Penn Oil Company, Bradford; F. W. Ellenberger, Kendall Refining Company, Bradford.

"Design of Long Distance Natural Gas Transmission Lines," R. G. Strong and T. H. Beals, Natural Gas Pipeline Company of America, Chicago.

"Potential Natural Gas Market of the East," James E. Pew, manager, Natural Gas Department, Sun Oil Company, Philadelphia.

"Some Economic Factors Affecting the Natural Gas Supply of the Appalachian Region," Alden Foster, petroleum engineer, Pittsburgh.

"Effects of Increase in Water Pressure on Water-Flooding Oil Production," Harry M. Ryder, Washington, D. C.

"Practical Aspects of Drilling the Clinton in Ohio," James F. Swain, Huntley & Huntley, Pittsburgh.

"Rotary Tool Drilling in Ohio," Noah Andrews, Union Drilling and Producing Company, Mt. Pleasant, Mich.

"Underground Gasification of Coal," L. D. Schmidt, Synthesis Gas Production Laboratory, U. S. Bureau of Mines, Morgantown, West Va.

• East Texas

Rodessa Production Promising On Hawkins Field West Flank

Production from the Rodessa sand appears promising for west flank of the Hawkins field; Wood County wildcat registers high structural position; Mexia field deep test nearing Travis Peak.

Wood County: Humble Oil & Refining Company's Little Sandy Club 1, Account 2, Edw. Wideman Survey and a Travis Peak test for the west flank of the Hawkins field, was making a drill-stem test of oil-saturated Rodessa sand after drilling through same to shale at 8691 feet. The sand zone was entered near the 8620-foot level, with elevation 318 feet, and a core below 8675 feet indicated 12 to 15 feet of fine grained sand, carrying oil and gas. The massive anhydrite was topped near the 8560-foot level. This deep test was drilled on the strength of Humble's McKnight 1, projected Smackover test for the northeast flank of the Hawkins Dome and currently drilling Cotton Valley below 12,050 feet, having indicated gas-distillate production when tester was used in the Rodessa at 8942-70 feet.

R. J. Caraway et al's Mullinax & Martin 1, Mary Polk Survey and scheduled Travis Peak test for a geophysical prospect, was credited with checking about 140 feet high in entering the Woodbine at 5330 feet, with elevation 471 feet.

Shell Oil Company's Goldsmith 12, Smackover test for the Quitman field, was drilling at 10,600 feet in Cotton Valley, topped near the 9700-foot level.

Limestone County: The Pure Oil Company's Berthelson 40, offsetting Woodbine production in the Mexia field, was making a drill-stem test at 5573 feet. First porosity in the Pettit was logged at 5509 feet, with elevation 511 feet, and a test of this zone at 5533 feet yielded salt water.

Houston County: Daniel Oil Company's Boykin 1, Jacob Prewitt Survey, logged Austin Chalk-Woodbine contact at 5822 feet, and abandoned in water sand at 5944 feet. Magnolia Petroleum Company's Grounds 1, J. C. Luce Survey and a Rodessa prospect, was running drill-stem test at 8413-45 feet, possibly in the Paluxy. The Georgetown was entered at 6980 feet. Continental Oil Company's Texas Long Leaf Lumber Company 1, Nicholas Lynch Survey, was drilling at 8390 feet in Woodbine, topped at 7925 feet.

Kaufman County: Humble's Guy 1, J. S. Ables Survey and 4300 feet northeast of its 6475-foot Travis Peak failure, entered the Georgetown at 3550 feet, correlating high, and was drilling lime at 3660 feet.

Cherokee County: Delta Drilling Company and Al Brown's Lester 1, John Russell Survey, structurally low for the general area, was drilling at 8305 feet to fulfill depth contract, calling for 200 feet of penetration of the Travis Peak. This wildcat tested water in the Rodessa at 8049-56 feet.

Bowie County: Tide Water Associated Oil Company-Seabord Oil Company's Dalby & Joiner 1, D. Puckett survey, was awaiting orders at 4248 feet. Barnsdall Oil Company and Sohio Petroleum Company's Greenwood 1, Smackover prospect, was due to set pipe after plugging back from 8188 feet to 7685 feet.

Wildcats: Humble has projected an aggressive exploration campaign throughout the district, and two of its scheduled deep tests involve McCord 1, Leander Smith Survey, Van Zandt County; and Rio Oil Corporation et al 1, Jesse Walker Survey, Wood County.

Marion County: Magnolia Petroleum Company's Hall Estate 1, Miles W. Moody Survey, second test for the Lassater field, took a drill-stem test of perforations at 9075-9118 feet, thought to be in the base of the Travis Peak, and obtained 1496 feet of distillate and gas-cut mud. The field discovery was completed from the top of the Travis Peak, pumping 40.3-gravity oil and salt water.

Harrison County: Arkansas Fuel Company et al's M. C. McCaulley, Sr. 1, P. Dougherty Survey, 3 miles east of Scottsville, wildcat, is drilling below 5683 feet. A recent drill-stem test of the Hill zone at 5296-5313 feet had a good blow and recovered 240 feet of oil-cut mud.

Committee Named to Study Maximum Stripper Recovery

A five-man committee to study the problem of obtaining maximum recovery of oil from stripper well reserves has been named by the Interstate Oil Compact Commission.

Hiram M. Dow, Roswell, N. M., chairman of the commission, announced that Don T. Andrus, Bradford, Penn., independent producer, will be chairman of the committee, with William J. Murphy, Jr., Austin, Texas, petroleum engineer and member of the Texas Railroad Commission, serving as vice chairman.

Other members of the committee include: J. E. Berry, Smackover, Ark., independent producer; Ivan G. Burrell, The Ohio Oil Company, Bridgeport, Ill., and Charles B. Peters, Jr., Tulsa, independent producer.

Principal purpose of the committee is to study the stripper well problems as they pertain to the necessity or advisability of governmental incentive or conservation payments to make recommendations pertaining to such payments.

ASME Picks Atlantic City For Its 68th Convention

The 1947 Annual Meeting of The American Society of Mechanical Engineers will be held in Atlantic City, N. J., December 1-5. This will be the third time in the society's 68-year history that it has held the largest of its national gatherings outside of New York City.

The Chalfonte and Haddon Hall will be headquarters hotels. About 200 engineers, scientists and industrialists will take part in the five-day program of technical sessions.

The theme for the year's series of meetings was announced as follows: "The Engineers' Responsibility in Increasing National Productivity."

• Southwest Texas—Lower Coast

La Gloria Townsite Extension Completed for Good Oil Well

La Gloria townsite extension test makes good oil well; new pay sand discovered on La Gloria southeast flank; potential run on Borregas extension well; oil production indicated in East Alta Mesa gas-condensate field.

Jim Wells County: Republic Natural Gas Company's Chas. Scott Trustee 1-C, on east flank of La Gloria field and located in La Gloria townsite, flowed on potential 226 barrels of 44.1-gravity oil daily through ⅛-inch choke. Gas-oil ratio was 626/1, tubing pressure 750 pounds and casing pressure 1050 pounds. Total depth is 6200 feet with 7-inch casing set to 6192 feet and perforated for completion at 6117-27 feet.

Magnolia Petroleum Company's El Contesto Unit 1-A, southeast flank of La Gloria field, is being completed in a new pay sand. Completion is being made through perforations at 7302-10 feet. A drill-stem test flowed at the rate of 96 barrels of oil daily on ⅛-inch choke.

Kleberg County: Humble Oil & Refining Company's King Ranch-Borregas 8, extension well at Borregas field, flowed on potential 211 barrels of 38.6-gravity oil daily on ⅛-inch choke. Gas-oil ratio was 881/1 and tubing pressure was 1680

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pounds, casing sealed. Total depth is 7803 feet and production is from perforations at 6966-78 feet. This well is about 3 miles northeast of the Borregas 1 discovery.

Brooks County: Standard Oil Company of Texas' B. G. de Garcia 7, outpost 4200 feet northeast of the de Garcia 4 gas-condensate discovery at East Alta Mesa field, has indicated oil production. A drill-stem test at 6320-24 feet developed 125 pounds working pressure in 20 minutes and recovered 6 stands of 42-gravity oil and 2 joints of oil, mud and salt water. A test at 6320-28 feet recovered 1000 feet of 42-gravity oil and 110 feet of salt water. After these operations hole was being cored below 6335 feet. If this well produces, it will be the first oil producer for the field.

Co-cop Obtains $4½ Million Refinery for $1,200,000

A Kansas refinery which turned out more than 1600 barrels of high-octane aviation gasoline during the war, and which cost the government in excess of $4½ million, has been purchased from the War Assets Administration by Consumers Cooperative Association of Kansas City, Mo., for $1,200,000.

Located at Coffeyville, about 80 miles northeast of Tulsa, the refinery was operated by Consumers Cooperative during the war, and was built by the government at a cost of $4,659,804. At one time its peak production reached 1665 barrels of aviation gasoline per day.

A similar but larger refinery at Ponca City, Okla., offered for sale by WAA, received only one bid—from Continental Oil Company of Ponca City, operators of the refinery during the war. Continental, which manufactured 100-octane gasoline at the plant, bid $3,034,040.03 for a part of the refinery, which WAA has assessed in its entirety at $8 million. Continental proposed to pay $2,554,696.18 in cash and the remainder of its offer on terms.

The refinery at Ponca City is about 100 miles southwest of the Cooperative's new plant.

• Middle Texas Coast

Wildcat Near George West Undergoes Production Tests

Production tests start on wildcat northwest of George West; casing set in likely field discovery west of Mineral field.

Live Oak County: Production tests were being made in Continental Oil Company's Albert West 1-D, wildcat approximately 3½ miles northwest of George West. Perforations are at 6780-94 feet in the Wilcox, total depth being 7411 feet with 7-inch casing set on bottom. A drill-stem test made at 6784-96 feet prior to setting casing flowed the water cushion with 600 pounds working pressure and recovered 40 feet of 47.5-gravity oil with 150 feet of mud.

Bee County: Gasoline Production Corporation's Harold E. Yoward 1, wildcat more than a mile west of Mineral field, has 7-inch casing set to 7818 feet for production tests. Several drill-stem tests were made prior to setting casing. A test at 7470-79 feet in the Slick sand recovered 950 feet of 40-gravity oil with 26 pounds working pressure. A test at 7479-87 feet developed 22 pounds working pressure and recovered an estimated 2500 feet of oil. A test at 7487-98 feet failed and another at 7502-10 feet developed 30 pounds working pressure and recovered 3000 feet of oil. The Luling sand was topped at 7628 feet and a drill-stem test at 7634-41 feet showed salt water. Total depth is 7884 feet.

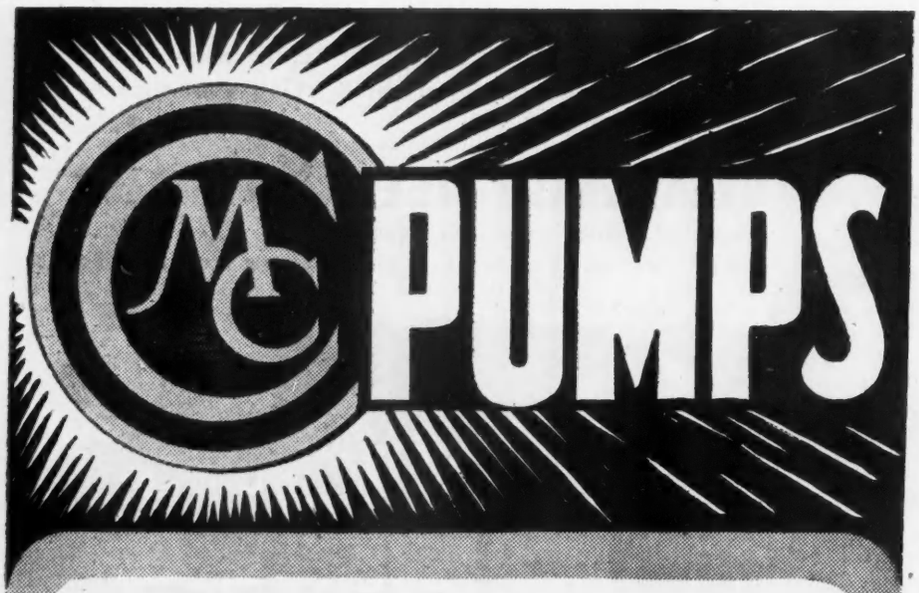
• Upper Texas Coast

Potential Run on Extension Try in North Cleveland Field

Potential run on North Cleveland field's north extension test; drill-stem test fails on Evergreen wildcat; Esperson field west extension gasser given potential; North Delhi outpost production gauged.

Liberty County: Texana Petroleum Company's Kempner 1, 3100-foot north extension to North Cleveland production, flowed 156 barrels of 40.3-gravity oil daily through ⅛-inch choke on potential. Flowing pressure on the tubing was 800 pounds and 900 pounds pressure on the casing, gas-oil ratio being 502/1. Total depth is 5788 feet with production from perforations at 5776-78 feet.

San Jacinto County: Mac Drilling Company's Cynthia Payne 1, wildcat 4 miles south of Evergreen, failed on initial drill-stem test. It flowed sand, silt, oil and salt water with 200 pounds tubing pressure and 275 pounds casing pressure on drill-stem test of perforations at 7686-98 feet. These perforations were squeezed and another test was to be made at the



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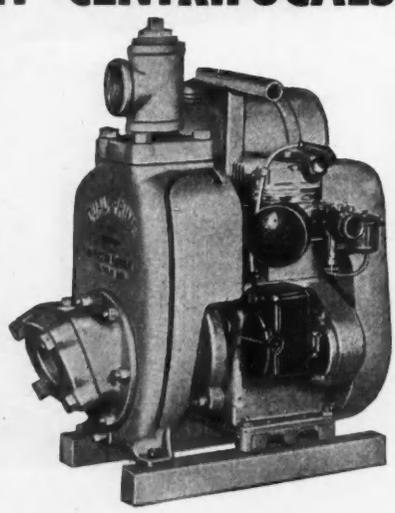

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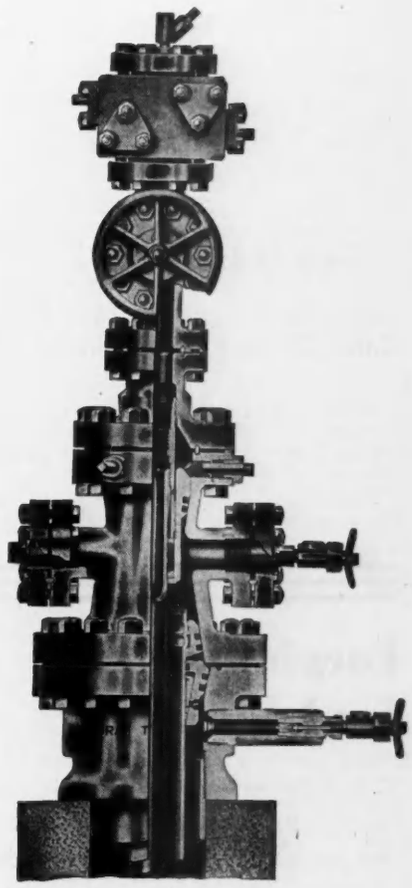

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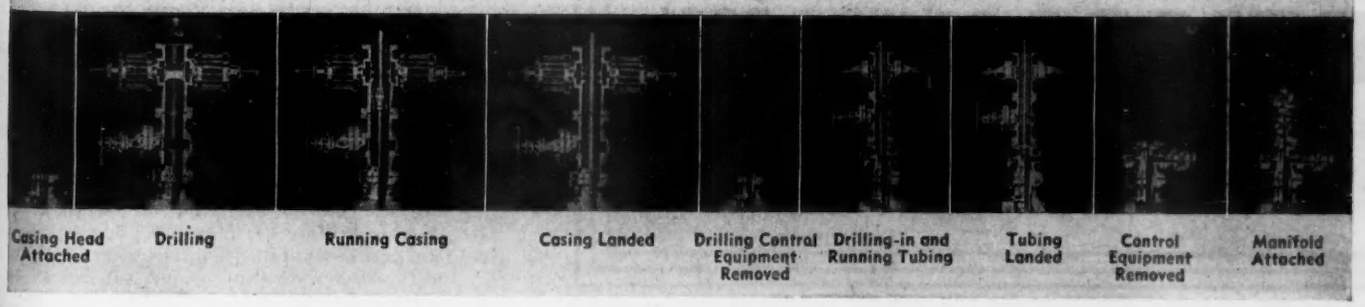

same interval. Prior to setting casing a drill-stem test at this interval recovered oil with no evidence of salt water. Total depth is 8260 feet with 5½-inch casing set to 7894 feet.

Harris County: Atlas Oil & Refining Company et al's A. B. Cohn Est. 1, outpost west of Esperson field in Meredith Duncan Survey, flowed on potential 11 million cubic feet of gas daily, open flow. On ⅛-inch choke it flowed gas and 1.76 barrels of condensate hourly. Total depth is 9094 feet with 5½-inch casing set to 9086 feet and perforated for completion at 8670-98 feet.

Humble Oil & Refining Company's North Delhi Unit 4, ½ mile northwest of Sun Oil Company and Cities Service Oil Company's Martin-Davis 1 at North Delhi field, has been given potential gauge. It flowed 2,991,000 cubic feet of gas and 38.7 barrels of 55.7-gravity condensate daily through ¼-inch choke, flowing pressure on the tubing being 2325 pounds and on the casing 2450 pounds. Total depth is 7108 feet with production from perforations at 7060-69 feet.

• South Louisiana

Longville Extension Test Has Good Oil Flow On Potential

Longville extension test makes good flow on potential; Magnolia to make additional tests in Cameron Parish discovery; core taken in Gulf of Mexico wildcat.

Beauregard Parish: Barnsdall Oil Company's Long Bell Lumber Company 3, extension test at Longville field in 6-6s-9w, flowed on potential 307 barrels of 49.1-gravity oil daily through 12/64-inch choke. Flowing pressure on tubing was 700 pounds and 900 pounds on casing. Total depth is 8640 feet with 5½-inch casing set to 8304 feet and perforated for completion at 8184-8203 feet. This well is approximately 48 feet higher than the discovery located ½ mile west. New test for the field is Barnsdall's M. E. Cooley Estate 1, north offset to the Long Bell Lumber Company 3.

Cameron Parish: Magnolia Petroleum Company is making additional tests in the Lutcher 1-C, discovery in 24-14s-11w. Several tests were made in the hole before original completion at 11,272-309 feet, where the well flowed 17½ barrels of condensate, 5 barrels of water and 3,907,000 cubic feet of gas daily through 12/64-inch choke. Plug was set and a new test was to be made at 10,762-832 feet. Total depth is 11,705 feet.

Terrebonne Parish: Magnolia was coring State 1, Lease 673, wildcat in the Gulf of Mexico 6 miles offshore from Point Au Fer field. One core has been taken at 11,687-697 feet, recovering 8 feet of shale, 1 foot of sandy shale and 1 foot of clean sand.

Secondary Recovery Survey

The Texas Railroad Commission is conducting a statewide survey of secondary recovery methods and is asking operators to furnish information on operations as of January 1, 1947. Blank forms may be obtained from all commission district offices.

Data sought include: field, county, name of producing formation, depth of producing formation, area affected (acres), type of project, number of producing wells, number of injection wells, 1946 production, average price per barrel, subsidy per barrel, employes (number), date secondary recovery started, and commission order number.

• North Louisiana

Delhi Field North Extension Completed from Paluxy Sand

Delhi north extension completed from Paluxy sand; Cotton Valley field deep pay test failure plugged back to test Davis sand; Gulf drilling important core test in Franklin Parish.

Richland Parish: Gulf Refining Company completed an extension to the Delhi field, Lee Donnell 2, NE SW 19-17n-9e, ¼ mile north of production. The well flowed 243 barrels of 39.7-gravity oil daily through 3/16-inch choke from the Paluxy "B" sand, perforated at 3136-66 feet. Total depth of well was 3403 feet with production casing cemented at 3233 feet. Farther south in the Delhi field the Paluxy pay was found carrying salt water with a trace of oil.

Webster Parish: Cotton Valley Operaotrs' Committee's deep test, Sam Banks 2, C SE NW 34-21n-10w, Cotton Valley field, plugged back to 8500 feet from 14,967 feet. A small amount of gas was tested from Gray sand at 10,803-88 feet. Next tests will be of the Davis sand at 8458-92 feet.

Franklin Parish: Gulf's George Washington 2-A, 11-15n-8e, a core-hole test in wildcat territory, was preparing to resume drilling below 2008 feet. Electrical logs marked top of the Wilcox at 1236 feet and Midway at 1815 feet, but no shows of oil or gas have been found. Production in this area would establish the first piercement-type dome production for North Louisiana.

Bienville Parish: Lion Oil Company's wildcat L. E. Ozley 1, C SW NE 13-17n-6w, 3 miles east of Bryceland, went to total depth of 10,732 feet and drilled plug from 7-inch casing at 7970 feet. Operators will run protective 5½-inch casing to bottom before drilling.

• Arkansas

Second Travis Peak Producer For Buckner Field Indicated

Second Travis Peak producer for Buckner field, Columbia County, indicated; spacing rules amended for West Lewisville field.

Columbia County: Grady H. Vaughn et al's Johnson-Hampton A-1, C SE SW 10-16s-22w, Buckner field, during a recent drill-stem test of the Travis Peak sand at 4887-92 feet, using ¼-inch chokes, recovered 836 feet of pipe line oil without formation water showing, indicating completion as the second producer in this pay for the field. Production casing has been cemented at 4891 feet to be perforated for completion tests.

Lafayette County: Spacing rules have been amended for the West Lewisville field, discovered in 1946. Hereafter, 1 well may be drilled to each producing horizon on an east-west governmental 20-acre drilling unit, on a line connecting the centers of the 10-acre units included in the 20-acre drilling unit. A tolerance of

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50 feet is allowed. Each producing horizon is given a basic drilling unit of 20 acres, which is assigned to the well drilled on that particular lease.

Stewart, Lewis and Crow Production Company's Moore Heirs A-1, C SW NW 13-16s-25w, Spirit Lake field, is coring at 4080 feet. Electrical log indicated oil sand at 3570-80 feet. Massive anhydrite was topped at 3915 feet by samples.

Miller County: E. A. Gabriel's Paul Martindale 1, C NW NW 32-14s-28w, wildcat, is drilling below 5278 feet. Base of the massive anhydrite was logged at 3596 feet.

• Mississippi

Jones County Prospect Halts At 10,240 for Electrical Log

Jones County's interesting wildcat halts at 10,240 for electrical log; Gulf tests Amite County Tuscaloosa prospect; new pay for La Grange field apparently assured.

Jones County: Gulf Refining Company's L. L. Majors 1, SEc NE 29-6n-11w, the state's most interesting wildcat, was preparing to run electrical log after reaching 10,240 feet. Sidewall cores between 9011-17 feet had ashy sand of fair porosity and salt water content. Shale stringer was indicated at 9027 feet while cores below that depth again tested salt water sand. No shows have been noted below 8617 feet in the lower Tuscaloosa zone.

Amite County: Gulf's J. A. Rowland, Trustee A-1, SWc NW 39-4n-2e, Tuscaloosa test, was preparing to test below 11,308 feet after encountering some encouragement in the Massive sand zone. Two sections of the zone were perforated at 11,325-30 feet and 11,340-44 feet and with packer at 11,227 feet the well had a fair blow for several hours. Hole was swabbed 3 times and on the final attempt water cushion and small quantity of oil were recovered. Later oil-cut mud and salt water with traces of gas were tested. Gravity of the oil developed was 37.1.

Wayne County: Humble Oil & Refining Company's G.M.&O. Land Co. B-2, NEc 24-9n-8w, developed slight shows from the Tuscaloosa zone below 9583 feet. In the first test casing was perforated at 9625-28 feet and the recovery was mud and salt water. Later the section was reperforated at 9620-24 feet and with packer at 9583 feet the well had a slight blow and recovery of mud cut with oil and gas. Tests continued.

Adams County: Texas-Pacific Coal & Oil Company's O. L. Wilson 2, SWc 8-6n-2w, La Grange field, was testing the regular producing 6200-foot sands after establishing potential production in the upper levels of the Wilcox. With hole bottomed at 6281 feet casing was perforated at 6275-76 feet with 6 shots and a drill-stem test yielded 90 feet of mud, 450 feet of oil and 900 feet of salt water in a 10-minute test. A second drill-stem test through these perforations tested dry. Previously the Wilcox had been perforated at 4640-42 feet and with 7/64-inch top choke the well flowed at the rate of 87 barrels of oil and 175,000 cubic feet of gas per day. On ⅛-inch tubing choke it flowed at the rate of 79 barrels of oil and 267,800 cubic feet of gas per day with the amount of gas rapidly increasing. A successful completion was recorded for La Grange when Roeser & Pendleton-Sohio Petroleum Company's R. Lee Parker D-1, S&W NEc 9-6n-2w, flowed at the rate of 136 barrels of 42.5-gravity oil per day from 40 perforations of the Wilcox at 6207-12 feet.

Forrest County: The Superior Oil Company's Maria Draughn 1, NEc 12-3n-13w, wildcat located more than 2 miles southeast of the Cassie Bradford, was fishing at 10,281 feet. No shows have been announced.

Florida

Gulf Refining Company's State 1, Lse 373, SWc 2-67s-29e, Monroe County, is drilling below 15,356 feet and continues to report shows in lower horizons. Cores from 14,675-78 feet recovered lime and dolomite with stain of oil. Cores from 14,685-94 feet showed slightly porous dolomite with shows of oil.

Carolina Test Quits

Standard Oil Company of New Jersey has discontinued drilling in its Pamlico Sound test, 11 miles south of Roanoke Island, N. C. Drilling was halted at 6370 feet after an unfavorable electric log at 6270.

• Ohio

Canton Activity Still Brisk; Salt Creek Test Is Oiler

Canton remains active; Clinton shows oil in Salt Creek test; La Grange pool extended; Elyria pool has second well.

Stark County: The town lot drilling in and around Canton is showing little letup yet. The count is 55 drilling, 10 rigs up, 10 locations made, and 9 wells completed in a week. Two small extensions were completed Hanley and Bird's Margaret Duff 1, SE NW 1, Canton Township, extended the field ½ mile east with a 3 million cubic foot well, and C. & S. Realty Company's Dorothy Martin 1, SW SW 27, Plain Township, extended the field ¼ mile north with a 2¾ milllion cubic foot well.

Muskingum County: B. G. Bartley's O. C. Robinson 1, SE NW 15, Salt Creek Township, had 325,000 cubic feet of gas and a good showing of oil near the bottom of the Clinton. After drilling down to the Medina sand where another oil showing was found, the two sands were shot and flowed 93 barrels and swabbed an additional 30 barrels in 40 hours.

Lorain County: The La Grange pool was given a small east extension by Ohio Fuel Gas Company on Lottie Burton 1, Lot 73, La Grange Township. Clinton at 2452-60 feet flowed 1½ million cubic feet natural. Glenn Harmon's Tony Polen 1, NW SW 3, Carlisle Township, came in at 500,000 cubic feet natural and made 850,000 when shut in after shot. This is the second well in the new pool southwest of Elyria.

• Michigan

Offset to Kimball Lake Find Tests Oil in Traverse Lime

Sun Oil Company's Anderson 1, NE NW NW 14-12n-13w, Newaygo County, diagonal northeast offset to the Kimball Lake discovery and first test in the area since the play was opened in February,

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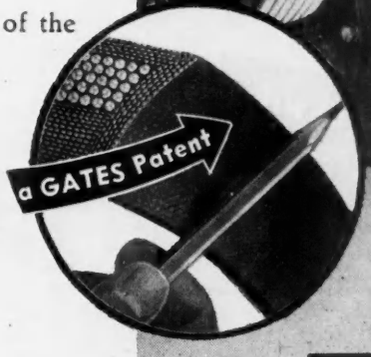

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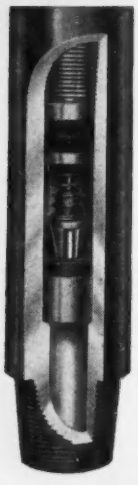

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flowed at an estimated rate of 10 to 12 barrels per hour on drill-stem test in Traverse lime from 2341-61 feet. Core showed 5 feet of good saturation. Company is drilling ahead to test Dundee before completing.

Michigan Devonian Petroleum Company's Corey 1, NE SW NE 16-16n-11w, Barton township wildcat, carried 2000 feet of oil and water in Traverse at 2490 feet. If lower objetcive horizons are dry an attempt to produce the Traverse pay may be made.

Mecosta County: The 2-year-old Wheatland play sustained another blow when The Carter Oil Company's Smith 1, NW SW SW 9-14n-7w, was dry in Dundee objective at 3790 feet. The test is ½ mile southeast of the lone producing well in the field.

Thirty-one drilling permits approved for the week equalled the 1946 high and set the peak for this year. However, 22 of the permtis called for facility wells in gas storage fields, to reduce the actual number of production locations to only 11. Consumers Power Company and Michigan Consolidated Gas Company expect to drill from 200 to 250 1300-1600 foot gas field storage wells this year. The 2 companies completed 76 wells of this type in 1946.

• Illinois Basin

Wayne County, Illinois, Test Is Pool Opener in McClosky

Wayne County, Illinois, pool opener completed from McClosky; Effingham County prospect continues testing after acid; Wabash County outpost makes production test in Paint Creek sand.

Illinois

J. W. Rudy's Hampton 1, SW NE NW 26-1s-5e, Wayne County pool opener a mile northeast of Keensville pool, has been completed for initial pump production of 125 barrels of oil in 24 hours from McClosky lime at 3156-63 feet, after 1000 gallons of acid.

Effingham County: Nu-Enamel Corporation's Adams 1, SW NW SE 10-6n-7e, 3 miles north of Bible Grove, pumped 70 barrels of oil and 70 barrels of water in 24 hours after 1000 gallons of acid in McClosky lime at 2868-77 feet. Well was re-acidized with 5000 gallons and testing continued.

Clark County: Arthur Castell's Bennett 1, SW SW NE 13-9n-14w, was on pump test for Casey sand production at 405-425 feet. The well swabbed a barrel of oil in 6 hours.

Wabash County: C. E. Skiles' Edith Helm 5, NW NE NW 15-3s-14w, a southwest outpost to production in the area near Grayville, set casing for production test of Paint Creek sand at 2642-62 feet. During a drill-stem test the well made 290 feet of oil and 160 feet of oil-cut mud.

Crawford County: Wallace Wright's Walters 1, wildcat in NE SW SE 19-7n-12w, was pump testing Salem lime at 1810-21 feet after swabbing 2½ barrels of oil per hour.

Indiana

John Savage's Hall 1, C of SE local 99-1s-10w, Gibson County, 3 miles north of the Princeton pool, swabbed 30 barrels of oil daily from Upper Cypress sand at 1662-72 feet to become a discovery of the East Patoka pool.

• California

Wildcat Near East Coalinga, Fresno County, Has Oil Sand

Oil sand cored in Sharples wildcat north of East Coalinga field in Fresno County; another wildcat started near King City in Monterey County; first test spuds on 11,000-acre lease in Kern County; Ventura County wildcat blows out with high gas pressure indicating possibility of a discovery; test for schist production to be drilled in Torrance field.

Fresno County: Sharples Corporation has cored a substantial footage of oil sand in Hyde 1, wildcat in 6-19s-16e. Top of the oil sand was located at 8278 feet and present depth, still in oil sand, is 8301 feet. Location is about 1¼ miles north of Eocene production in the Amerada area of the East Coalinga field. The well is the first to be drilled by this operator in California.

As a followup to its oil discovery 3 miles southeast of the town of San Joaquin, The Superior Oil Company has staked Keisson 35-32 in 32-15s-17e. Site for the second well is about ¼ mile due west of its Hackala 55-32 discovery which was completed flowing 145 barrels of 30.8-gravity oil through 9/64-inch choke.

Monterey County: The Texas Company has made a location on the Oasis Anticline for Currel 2, 5 miles south of King City in 4-21s-8e and about ½ mile northeast of Currel 1, abandoned last fall at 3280 feet. Only other active wildcat in the county, Shell Oil Company's Honolulu-Thorup-U.S.L. 1, 4 miles west of King City, is being abandoned at 5591 feet.

Kern County: Superior has staked Quinn 51, wildcat in the Jasmine area, 20-25s-27e. Site falls about 2¼ miles west of the small field discovered in this area last year by Pacific Oil and Gas Development Corporation.

Universal Consolidated Oil Company set casing at 4890 feet in Sauerdough 11, easterly extension test in the Cymric field, 23-29s-21e, and was preparing to complete in the Oceanic Sand. The deeper Point of Rocks sand was found unproductive in this well.

In the Salt Creek area of the field Independent Exploration Company has staked locations for its third and fourth wells in its new fault block discovery on its Roco lease, 18-29s-21e. The second well, Roco 2, drilled largely for geological information on which to base further operations, was a dry hole.

Independent Exploration and Bandini Petroleum Company have spudded their first joint test on a big 11,000-acre lease acquired from Kern County Land Company in the Pleito area 3 miles south of the Wheeler Ridge field. Location of KCL-A 11-10 is in 10-10n-20w. A core at 1418-21 feet showed 2 feet of conglomerate.

Shell Oil Company has drilled through the Vedder in its Ten Section field deep test, but has stuck drill pipe at 11,800 feet. Total depth is 13,745 feet.

Ventura County: Standard Oil Company of California's McGrath 2, wildcat in the Montalvo area, 26-2n-23w, blew out of control during a shutoff test, flowing gas, but no oil. The gas caught fire and burned for 2 days before being extinguished. Uphole showings are sched-

uled for tests. The high gas pressure may presage a discovery.

Los Angeles County: A test for schist production in the Torrance field will be drilled by R. W. Jerman, who has derrick up for Robinett 1 near the intersection of 229th and Narbonne Streets in 23-4s-14w. The schist is productive in the El Segundo field about 5 miles north.

Richfield Oil Corporation is running casing to complete Union Pacific Unit 4 in the East Los Angeles field. The well flowed a good volume of clean oil on a test of the interval 8570-90 feet.

A flurry of interest in the Canoga Park area of the San Fernando Valley, due to the discovery of paraffin base oil in a 200-foot water well, subsided when a second well, Vincent Stabeck's Knapp 2 in 4-1n-17w, was abandoned at 765 feet.

• Rocky Mountain Area

Wyoming's Steamboat Butte Field Is Given Extension

Steamboat Butte field, Wyoming, given mile southeast extension; Wyoming's second deepest test being abandoned; South Fork area wildcat swabs oil from Embar after acidizing; test planned northwest of Elk Basin field, Montana.

Wyoming

The Brinkerhoff Drilling Company operation a mile southeast of the Steamboat Butte field is a definite field in the Tensleep horizon after recovering more than 4000 feet of oil on a 1-hour drill-stem test. The well, No. 1 Tribal 4781, NW NW NW 9-3n-1w Freemont County, was waiting on cement after setting 5½-inch casing at 6842 feet. Tensleep was topped at 6828 and the test is bottomed at 6923 feet. The drill-stem test was taken at 6886-922 feet. This operation is on a Sohio Petroleum Company farmout. Tensleep is the fifth formation to show oil on drill-stem tests in this well. The field proper now produces 6000 barrels of oil daily from 12 wells in the Sundance and Tensleep formations. British American Oil Producing Company controls the majority of the acreage on the structure.

The second deepest test in Wyoming is being abandoned after failing to find commercial gas production in sands below 10,000 feet. Sinclair Wyoming Oil Company's Unit 1, NE NE NW 35-39n-91w, was drilled to 12,600 feet, where casing was run to test sands which had shown some gas on drill-stem tests. Perforating and testing were conducted progressively up the hole to 10,300 feet and on the last test the well made an estimated 400,000 cubic feet of gas with some water. This wildcat failed in reaching its Frontier objective because of extreme thickening of Upper Cretaceous beds.

Washakie County: General Petroleum Corporation's wildcat in the South Fork area is now swabbing oil from the Embar formation after acidizing that section. The well is 88-24-G, SE SE SE 24-46n-92w, and was drilled to 10,900 feet, total depth, before plugging back for the Embar test. Casing was cemented at 10,347 feet, through the Embar, before drilling into the Madison, and a drill-stem test taken below the casing showed only a small amount of mud and water. Both the Tensleep and Madison formations were hard and tight and revealed no saturation. The Embar had shown thin streaks of saturation in cores when drilled, but on testing through perforations between 10,046-125 feet, the well made only 300 feet of oil-cut mud. Following a 2000 gallon acid shot the well made 23 barrels of oil in 2 hours, and operator is still cleaning the hole. This test is 10 miles south of the Worland Field, operated by The Pure Oil Company, where three wells are now productive from the Embar formation and 2 are being drilled to this horizon. At Neiber Dome, 10 miles southwest of South Fork, The California Company recently made an Embar lime discovery good for 10 barrels of 41-gravity oil per hour natural. Oil from the Embar formation in this district has been extremely high in sulphur content and it is reported desulphurization plants will be necessary before the crude can be marketed.

Montana

Sinclair Wyoming has located a test 1 mile northwest of the Elk Basin field, Carbon County, along the Wyoming-Montana line, and will soon move in equipment for a 5000-foot well. Location is at Wilkins 1, NW SW NW 28-9s-23e. The Elk Basin field is the largest producing field in Wyoming, making 15,000 barrels of oil daily from 125 wells in the Tensleep formation, and 300 barrels daily from 150 wells in the Frontier formation.

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8—Ingersoll-Rand, Type 20, two stage 5"&2½"x4", with 7½ HP Allis Chalmers direct current motors

Also water circulating and sump pumps, direct current motors and motor starters ½ to 7½ HP, switch boards and other items.

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Trading Post Section

FOR

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WANTED TO BUY

■ Wanted to Purchase: A used Schmidt type vertical intensity field magnetometer in good condition. Address Box 20 c/o The Oil Weekly, Houston, Texas.

■ WANTED — One Amerada pressure bomb 1¼" O.D. 4000# element complete with clock and accessories. Engineering Service Co., Inc., P.O. Box 3094, Corpus Christi, Texas.

■ Drilling equipment wanted—1500 Failing, 37 Sullivan, F Franks, or other make of similar capacity. Fred Butler, 1013 Cedar, Casper, Wyoming.

WANTED TO BUY

• WANTED TO BUY: 500 feet 2⅜" flush joint drill pipe used or new. Rotary drill rig mounted on truck good for drilling to 3,000 feet. James H. Feese, 1311 East Third St., Casper, Wyoming.

• WANTED rod and tubing machine mounted on truck with telescopic mast. Must handle 3500 foot wells 2½" tubing. Nabob Oil & Gas Company, Box 448, Amarillo, Texas.

• Wanted: Power pipe threading machine to thread pipe up to 6 inches in diameter. Give details as to condition of machine and dies to go with machine. Don Roe, Vandalia, Ohio.

LEASES, DRILLING, ACREAGE, ETC.

INVESTORS

Independent Geological and Geophysical organization completely equipped and staffed, is seeking finance to purchase royalties in advance of drilling known structures. Have surveyed for Majors many oil pools in advance of the bit. Also leasing blocks to be drilled with our own equipment. All plays in States of Michigan, Ohio, Indiana, in which we have maintained field offices and scouts for the past ten years. Correspondence invited. Address: Box 16, c/o The Oil Weekly, Houston, Texas.

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In Lea, Eddy, Otero, Chaves, Roosevelt, DeBaca, and Curry Counties, New Mexico.

ALSO PRODUCING WELLS FOR SALE located in Loco Hills and Turkey Track Areas, Eddy County, New Mexico.

Write for exact locations and other information—Robert E. McKee, General Contractor, P. O. Box 562, El Paso, Texas.

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• Will buy producing oil properties out-right or operating interest. Want proven or semi-proven shallow acreage to drill. Phone C 4-3121, Box 835, Houston 1, Texas.

SITUATIONS WANTED

• Seven years experience major company clearing titles producing leases, handling pooling agreements, indemnities, deeds and assignments; for past two years and now supervisor division order section; licensed attorney; middle age. Desire change, preferably independent. Good standing present employer; furnish excellent reason for change. Address: Box 17, c/o The Oil Weekly, Houston, Texas.

• TITLE ATTORNEY—over twelve years experience, desires connection with oil company or individual in Oklahoma. Box 5205, Farley Station, Oklahoma City, Oklahoma.

EXPLORATORY FAILURES

ARKANSAS WILDCAT

Logan County: M. J. Reinhart's B. Nagle 1, c ne ne 11-8n-24w, abnd 3-20-47 at 4782.

CALIFORNIA WILDCATS

Kern County: Barnes and Shadrick's Barlow 2, 30-31s-30e, Arvin area, Granite 1814, abnd 3-16-17 at 1820.

Independent Exploration Co.-Oceanic Oil Co.'s Roco 2, 18-29s-21e, Cymric area, Carneros 1795, Brown shale 1130, abnd 3-18-47 at 2198.

Tulare County: Superior's Day 24-22, 22-23s-26e, Earlimart area, abnd 3-17-47 at 4173.

Solano County: National Investors Vund's Burke & Donahoe 1, 12-4n-1w, Petrero Hills area, abnd 3-15-47 at 2259.

Kings County: Kings Exploration Co.'s Avenal 1, 18-23s-17e, Reef Ridge area, abnd 3-19-47 at 6927.

Orange County: Bandini Pet. Corp.'s Segerstrom 1, 34-5s-10w, Fairview area, abnd 3-17-47 at 6927.

Los Angeles County: Bradford Bishop's Baldwin 1, 3-2s-11w, N. Whittier area, abnd 3-21-47 at 3642.

Vincent F. Stabeck's Knapp 2, 4-1n-17w, Canoga Park area, abnd 3-13-47 at 765.

Ventura County: Honolulu Oil Corp.'s Honolulu-Signal-Bates 1, 36-4n-25w, Rincon area, abnd 3-12-47 at 6381.

FLORIDA WILDCAT

Gadsden County: Havana Syndicate's A. M. Butler 1, se sw 30-3n-1w, abnd 3-15-47 at 4010.

NORTH LOUISIANA WILDCATS

Franklin Parish: Gulf's George Washington 1-A, 1092 fr sl 659 fr wl 11-15n-8e, abnd 3-10-47 at 533.

C. H. Murphy, Jr.-Sun Oil's J. E. Core 3, 1968 fr nl 2020 fr el 34-16n-8e, abnd 3-6-47 at 490.

Ouachita Parish: Petersen Drlg. Co.'s Breece Lbr. Co. 1, sw 14-18n-5e, Gas Rock 2310, Anhydrite 2784, abnd 3-7-47 at 2785.

Union Parish: California Co.'s W. E. Weldon 1, 2011 fr nl 1787 fr el; 24-21n-3w, Cotton Valley 7320, Bodcaw 7788, abnd 3-7-47 at 8476.

NORTH LOUISIANA WILDCAT

Union Parish: Shell's Frost Lbr. Co. 1, ne 6-21n-1e, abnd 3-20-47 at 3600.

Richland Parish: M. W. Shriver Co.'s Mrs. H. H. Coon 1, c sw sw 1-16n-1e, base Annona 2979, Massive Anhydrite 5137, James 6133, Pettit 6405, abnd 3-18-47 at 6908.

SOUTH LOUISIANA WILDCAT

Iberia Parish: Falcon-Seaboard Drlg. Co. et al's Willie Lopez 1, se¼ ne¼ 1-12s-5e, 5 mi ne Jefferson Island fld, 5 mi sw Spanish Lke Prospect on Humble farmout, abnd 3-15-47 at 11,608.

MISSISSIPPI WILDCAT

Hinds County: Dwight H. Sanford's School Land 1, ne se sw 16-6n-1w, Wilcox 1520, Midway 2790, Gas Rock 2908, abnd 3-20-47 at 3516.

NEW MEXICO WILDCAT

Chaves County: Atha Exploration Co.'s Lightcap 1, c sw nw 24-7s-28e, jkd and abnd 3-20-47 at 1200.

NORTH CAROLINA WILDCAT

Pamlico Sound: Standard of N. J.'s Esso 2, 17 mi fr Manteo, 32 mi n of Hatteras Light, 3 mi w of Barrier Beach, 11 mi s Roanoke Island, abnd 3-13-47 at 6370.

OHIO WILDCAT

Cuyahoga County: Ohio Fuel Gas Co.'s S. W. Jennings 1, Lot 3, Olmsted, abnd 3-14-47 at 2747.

OKLAHOMA WILDCATS

Cotton County: H. Bowers' Musgrove 1, se se sw 32-2s-11w, abnd 1756.

Houston Browers' Wolf 1, se se sw 21-3s-11w, abnd 1602.

Bridwell O&G Co.'s School Land 1-C, 36-3s-11w, abnd 1926.

S. W. Sleimaker's Matis 1, se se nw 36-3s-12w, abnd 2111.

Hughes County: Sohio's Wallace 1, sw se nw 29-9n-11e, abnd 3139.

Jefferson County: Davidor Brothers' Norman 1, 13-6s-8w, abnd 2520.

Lincoln County: L. B. Jackson et al's Wright 1, sw sw ne 27-17n-6e, abnd 3030.

Logan County: Jordon Pet. Co. et al's Stark 1, sw sw nw 7-15n-1e, abnd 5210.

Falcon-Seaboard Drlg. Co.'s Faver 1, se sw nw 26-15n-1e, abnd 5600.

Oklahoma County: Double R Drlg. Co. et al's Henderson 1, sw sw sw 24-14n-1w, abnd 5849.

Osage County: Texas Co.'s Osage 1, sw ne se 22-26n-5e, abnd 3061.

Pawnee County: Deep Rock Oil Corp. et al's Dunham 1, nw nw sw 20-20n-6e, abnd 3603.

Seminole County: Fred T. Haddock et al's Brown 1, nw sw se 12-7n-7e, abnd 3542.

Stephens County: Joe E. Trigg's Hill 1, nw nw nw 6-2n-7w, abnd 9176.

Kadane & Sons' Miller 1, nw nw ne 20-2s-8w, abnd 3003.

WEST TEXAS WILDCAT

Pecos County: Pure's Oates 1, 673 ewl 1979 nsl GC&SF Ry. 11, blk 121, elev 3617, dolomite 1823, abnd 3-12-47 at 1860.

NORTH CENTRAL TEXAS WILDCAT

Taylor County: J. Ralph Stewart et al's Lewis 1, 330 snl 1600 wel T&P Ry. 49, blk 19, elev 1888, Dothan 2455, Noodle Creek 2567, Saddle Creek 2810, abnd 2-27-47 at 3275.

NORTH CENTRAL TEXAS NEW PAY TEST

Throckmorton County—Odell Field: Woodley Pet. Co.'s Odell 1, 1877 nsl 660 wel sect 695, TE&L Co. sur, offset shallow wells, elev 1253, Palo Pinto 2133, Bend 3966, Mississippi 4582, Ellenburger 4830, abnd 3-15-47 at 4940.

NORTH TEXAS WILDCATS

Clay County: Frank Wood et al's Taylor 1, 1000 wel 3000 nsl sect 1, Specht & McCutcheon sur, elev 952, abnd 3-12-47 at 2505.

Jack County: Stephens Pet. Co.'s Slusher 1, 640 snl 1350 ewl e½ sect 2, W.C. Ry. sur, A-2169, elev 1014, Bend 4500, abnd 3-17-47 at 4600.

Knox County: Doyle Pet. Corp.'s Bates 2, 1390 nsl 1230 ewl sect 1, blk 2, D&W sur, elev 1355, abnd 3-9-47 at 1635.

W. J. and John Moran's Brown 1, c sw sw H&TC Ry. 172, blk 44, elev 1627, lime 3640, Mississippi 6376, abnd 3-19-47 at 6502.

Montague County: Continental's Moss 1, 467 out sec J. W. Clanton sur, elev 846, Bend 5546, Ellenburger 5888, abnd 3-12-47 at 5995.

SOUTH CENTRAL TEXAS WILDCATS

Atascosa County: Mellie Pegg, Milton Pegg, W. H. Bode's Mrs. Josephine Rogers 1, 375 fr sly/wl 335 fr wly/nl 103-ac lse, J. Conley sur, 6 mi n Poteet, Wilcox 140, Navarro 1636, Taylor 2272, abnd 3-12-47 at 2362.

Edwards County: Dan Auld's Hal & C. V. Peterson 1-A, 615 fr wl 510 fr sl 160-ac tr, being se¼ AB&M sur 16, blk 2, Ellenburger li 4715, abnd 3-12-47 at 5080.

SOUTHWEST TEXAS-LOWER COAST WILDCATS

Duval County: Continental's Clara Driscoll A-lse 2, 1100 fr el 1250 fr sl sect 53, sbdn Sta. Rosalia Gr, 2 mi nw Conoco Driscoll fld, abnd 3-13-47 at 3420.

R. H. Harn's Juan Stillman 1, 330 fr nl 330 e (not ra) fr wl 285-ac lse and 885-ac tr, nwc sh 8, abnd 3-9-47 at 6015.

Jim Hogg County: Standard of Kansas' Carlotta F. de Guerra 1, 330 fr ne&nwl blk 14, E. J. Foster sbdn Carlos Guerra ls, Las Cuevitas Gr, abnd 3-8-47 at 2511.

Starr County: L. W. Conner et al's Erna Weahrle 1, 467 fr n&el 121.31-ac tr and tr 134 in J. H. Slayton sur, 1½ mi nw Rincon fld, abnd 3-10-47 at 5510.

R. C. Hillman's Guerra 1, 330 fr n&el tr 224, 330 w of el Antonio Sanchez porc 69, 6 mi n Roma, abnd 3-11-47 at 385.

Lockhart & Co.'s Domingo L. Garza 1, 467 fr sly/sl 467 fr ely/wl sur 164, 607-ac lse, 5 mi w Rincon fld, 3½ fr n Ross fld, abnd 3-12-47 at 5640.

Webb County: Houser & Campbell's E. Garcia Est. 1, 660 fr s&el blk 31, sur 592, Los Ojuelos Tr, 80-ac lse, 2 mi n Hughes fld, 1 mi e Mirando City fld, abnd 3-12-47 at 2510.

MIDDLE TEXAS COAST WILDCATS

DeWitt County: Hunt Oil Co.'s Alfred Friar 1, 660 fr ne&sel John Dawley sur 497-ac lse, 6 mi n Thomaston fld, 10 mi sw Brushy Crk fld, abnd 3-12-47 at 8263.

Lavaca County: Barnsdall's Joe Matula 1, 851 fr nwl 1457 fr nel 1256 fr sel 2062 fr swl swl Vincent Meyers sur, 170.3-ac lse, 8 mi se Hallettsville, abnd 3-8-47 at 10,006.

Live Oak County: Smith-Story-Wood Corp.-Skinner & Eddy Corp.'s Eva Pugh 1, 330 fr swl 1363 fr sel 229-ac lse, Eduardo Ramirez sur 15, abnd 3-6-47 at 4105.

Refugio County: Mackshank Pet. Co.'s F. V. W. Heard 1-B, 3180 fr el 3570 fr wl 3800 fr nl Mary & Ann Roach sur, 1 mi w Refugio fld on 1134.5-ac lse, abnd 3-2-47 at 6704.

Victoria County: Sunray's J. A. McFaddin Est. 9-A, 1000 fr sel 3380 fr swl portion of 8293.33-ac lse, Francisco Ramon sur, 4 mi w of N. McFaddin fld, 3 mi nw Kay Crk fld, 2½ mi s sw Edwards Rch fld, abnd 3-8-47 at 6310.

MIDDLE TEXAS COAST OUTPOST

Lavaca County—Yoakum: Pure's Wm. Reese unit 1, 500 fr nely/swl 330 fr sely/sel 42.7-ac W. Reese tr, John May sur, 3750 n ne Pure's Chandler 1, n extension well, abnd 3-10-47 at 9431.

George D. Mitchell, Jr., is president of the Advanced Exploration Company, Inc., reorganized in Houston. Other active stockholders are **C. W. Bocock,** first vice president; **A. I. Bartow,** second vice president; **Louis Poindexter** and **F. Ritchey Wallace. Miss Jo Doss** is secretary-treasurer.

Reese H. Taylor, president of Union Oil Company, spoke on oil before 20 of California's leading newspapermen who have just completed a 16-day tour of California industry sponsored by the National Association of Manufacturers.

Tom T. Freeman, superintendent of the land department for The Texas Company in the West Texas-New Mexico Division the past 16 years, will move from Fort Worth to Denver, where he becomes assistant manager of the Rocky Mountain division. **E. W. Lewis,** assistant to Freeman, has been appointed his successor.

R. O. Mangum of Alice and **S. E. McDaniel** and **R. C. Paul** of Houston have organized Victor Oil Company with capital stock of $50,000. Headquarters are at Houston.

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When we say *super service,* we mean just that! Because AMERICAN SUPER HEAVY DUTY ROLLER BEARINGS are *specially built* for applications requiring *super* strength . . . *super* performance . . . *super* endurance. They are not just "stock" bearings. Often they are designed to exact specifications for the job they are required to do. Their vital, extra capacity to render continuous 24-hour-a-day performance in the heaviest equipment built, under the most adverse service conditions to be encountered in modern industry, is the reason why, for more than 25 years, AMERICANS have been first choice with manufacturers and designers of heavy industrial and oil country machinery. Once adopted, no manufacturer has ever had to switch from AMERICANS. Write today for complete technical details.

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Pacific Coast Office: 1718 S. Flower St., Los Angeles Calif.

AMERICAN
Heavy-Duty ROLLER BEARINGS

M. L. Kerlin, senior geologist in Jackson, Miss., for Shell Oil Company, has been made senior geologist in the Houston office. **J. M. Deuth,** Tallahasse, Fla., has been transferred to the Jackson office as geologist. **W. S. Pike, Jr.,** senior geologist at Baltimore, has been named senior geologist at Tallahasse. **J. M. Bugbee,** senior exploitation engineer in the Premont, Texas, office, has been transferred to Houston with the same position. **N. Wallace,** garage foreman at Tulsa, has been named field supervisor at Houston. **W. H. Cline,** cashier in the treasury department, Houston, has been named supervisor of office service.

O. G. Carson of Galena Park, Texas, has gone to Colombia to assume his duties as production foreman for Colombia Petroleum Company in Cucuta. Carson formerly was with Brown & Root, Inc.

Dan W. McCauley, former division geologist for The British American Oil Producing Company at Houston, has joined Tennessee Gas and Transmission Company. **Jack A. Lewis,** Upper Gulf Coast examiner for the Federal Petroleum Board, Department of the Interior, has joined the company as a petroleum engineer.

William A. Holloway, formerly with the Conservation Division, Oklahoma Corporation Commission, has joined Standard Oil Company (Indiana), Crude Oil Purchasing Department as scout in the Oklahoma City area. Holloway is a graduate of George Washington University and served three years as captain in the Marine Corps.

W. E. Bates has been appointed representative of the crude purchasing and sales division of The Texas Company at Midland, Texas. Bates joined the company in 1920 and prior to being appointed to his new position was title examiner.

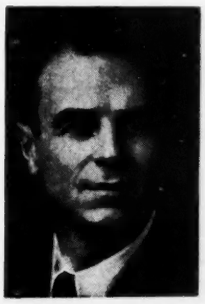
D. E. Heasley and **W. M. Crumpler** of Houston have incorporated the Heasley & Crumpler Drilling Corporation to operate in Texas.

Dr. A. N. Murray, professor of geology at the University of Tulsa, spoke on "The General Geology of the Uinta Basin" before the Shawnee (Okla.) Geological Society March 13.

Willard Julander has been transferred by Stanolind Oil & Gas Company from the Casper Division office to Salt Lake City as geological scout.

Harry E. Estes is now assistant to the president of A-1 Bit & Tool Company, Houston. He formerly was connected with Reed Roller Bit Company, serving 11 years in the sales department as assistant to vice president in charge of sales, 3½ years as assistant to the vice president in charge of manufacturing, and 3½ years as salary personnel manager.

J. R. **Mooney** has been appointed general manager of Texasteel Manufacturing Company, Fort Worth, makers of electric steel sucker rods and other sub-surface equipment. To take the Texasteel post, he resigned as manager of a large firm of inspection and consulting engineers. He is an active member of the AIME, AREA, ASTM, API, and the Iron and Steel Institute, the American Society for Metals and the Western Society of Engineers, and is a past secretary and director of the Chicago Engineers Club.



J. R. Mooney

»

E. B. Johnson and **Jay Taylor** of Amarillo and **William H. Baker** of Dallas have organized the Baker & Taylor Drilling Company with paid-in capital stock of $60,000. Headquarters are at Amarillo.

»

Ray J. Dilger, general manager of Texas operations of Fred M. Manning, Inc., Denver firm that has developed 3300 barrels daily production in North Texas within the past 2 years, has transferred headquarters from Wichita Falls to Fort Worth.

Deaths

B. L. Carman, 74, retired oil operator, died March 19 of a cerebral hemorrhage at Dubuque, Iowa. Carman spent his entire life in the oil industry, beginning as a tool dresser at Montpelier, Ind. He spent 36 years with Oil Well Supply Company, advancing to manager of the Ohio district with offices at Bremen. After his retirement he moved to Lima and became president of The Carman Oil Company.

»

W. J. Richardson, 54, West Texas oil producer, died March 21 in Dallas after a lengthy illness.

»

J. S. (Jimmie) Davis, 40, drilling and production superintendent for Jay Simmons, died of a heart attack March 13 in Corpus Christi.

»

Emanuel W. Hartman, 66, Oklahoma oil operator and repressuring contractor, died in Tulsa March 18. A native of Wilkes-Barre, Penn., Hartman was a specialist in concrete work. During the 1920's Hartman became interested in oil and in the development of special oil industry equipment. He installed what was then considered the largest shale oil retort in the world, at Ashland, Ore., in 1926. He also developed a high-pressure gasoline cracker which is now widely used.

»

J. J. Wilson, 59, Seattle branch manager for John A. Roebling's Sons Company, died March 6. Born in Lawrence, Kansas, Wilson moved to Seattle in 1905. He was widely known in the mining and logging industries as a wire rope engineer and it was in this capacity that he began his association with Roebling in 1920.

»

M. J. Clark, Jr., Shell Pipeline Company pilot, was killed when his airplane crashed near the Houston airport March 22. A native of Auburn, Neb., Clark was employed at the Tulsa airport for Shell until his recent transfer to Houston.

»

Harry J. Foreman, 59, Tulsa, an employe of Bethlehem Supply Company for six years, died March 23. A native of Pennsylvania, he had lived in Tulsa since 1915.

»

Walter Gundelfinger, 60, division superintendent of the Main Lines Division of Ohio Fuel Gas Company, died March 18 at Wellston, Ohio.

PETROLEUM PRODUCTION

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By PARK J. JONES, Consulting Engineer, Houston, Texas

The first of a series of five volumes dealing with the application of the basic engineering principles of drilling oil wells and extracting the oil most efficiently and economically. Presented by a nationally known authority, formerly with The Texas Company, the information is highly practical, and is detailed, specific, and thoroughly documented. The treatment is as clear, concise, and simple as possible, and the explanatory matter is illustrated by extensive use of graphs.

This volume and those in preparation should be welcomed by all petroleum technologists, geophysicists, mechanical engineers and physical chemists as an outstanding contribution which fills a vacuum in the literature of petroleum. It assembles a vast amount of data which were previously scattered or unsystematized and provides a quick and accurate reference source for the entire industry.

Volume I **231 Pages** **Illustrated** **$4.50**

Volume II: Optimum Rate of Production

This is the second in a series of five volumes which will comprise the most thoroughgoing treatment of the engineering aspects of petroleum production ever presented. Contents include: The Maximum Efficient Rate of Production; Oil, Condensate and Natural Gas Reserves; Well Producing Capacity for Reservoirs; Interest Factors; The Period of Development; Uniform Rates of Production; Uniform Rates of Depletion; Economic Limits for Wells and Reservoirs; Increasing Rates of Depletion; Decreasing Rates of Depletion; The Optima for Uniform Rates of Depletion; The Optima for Variable Rates of Depletion; Exponential Functions; Natural Logarithms. **295 Pages, $4.50**

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Worthington Pumps are adaptable for use with engines or motors of any specified type or manufacture, to provide a complete pumping unit.

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SQUEAKS from the BULL WHEEL

This Curious World

They say frequent drinking of water will prevent stiffness in the joints. Trouble is, most joints don't serve water.

When a girl is cool as a cucumber, it's a cinch she's not green.

One day little Audrey locked the bathroom door, threw the key away, then sat down and laughed and laughed, because she knew her father was going to have a beer party that night.

Nobody ever kissed a girl unexpectedly. The closest you can come to it is to kiss her sooner than she expected.

Definition: The boss is a man who's at the office early when you're late and late when you're early.

Scotch remedy for seasickness: Hold a quarter between your teeth.

Have you heard about the two little fleas who worked hard and saved their money and finally went out and bought their own dog?

Only thing worse than being a bachelor is being a bachelor's son.

Insulated

"Dearest, I've noticed lately that your kisses are getting colder."

"Nonsense. You've simply been getting your lipstick on thicker."

Woo in Wisconsin

There was a young fellow in Wis.
Who struggled in vain for a kiss.
Said he, "It befits you
To learn Jiu Jitsu
In Wis. for a kiss from a miss!"

Good Swap

"Goodness, George, this isn't our baby. It's the wrong carriage."

"Sssh! It's a better carriage."

Daily Half Dozen

Six sailors and their lady friend were finally rescued from an island upon which they were marooned for a year. One of the sailors was relating the experience to his minister, who asked: "And was the lady chaste?"

"Boy! Was she? From one end of the island to the other."

Hints for Householders

If you like his mighty sinews
And he stirs the gypsy in you
So that you want him close ag'in you
Maybe you're the wolf!

Life Is Like This

"Murphy got rich quick, didn't he?"

"So quick that he can't swing a golf club without spitting on his hands."

Fun to Be Foolish

"I said some very foolish things last night when I was out with my boy friend."

"Yes?"

"That was one of them!"

Diagnosis Guaranteed

"So the doctor told you that you wouldn't live a week longer if you didn't stop chasing women. Did he really mean it?"

"I'll say he did. It was his wife I was chasing."

Life Is Like This

"Those are my grandmother's ashes."

"Oh, so the poor old soul has passed on?"

"Nope. She's just too lazy to look for an ash tray."

The Woman's Way

"You don't love me any more!"

"Why, darling, of course I do."

"I don't believe it. You simply couldn't love a woman with such old clothes as I have."

Once in a Lifetime

He called up the newspaper and reported the birth of twins.

The girl at the desk didn't quite catch the message. "Will you repeat that?"

"Not if I can help it!"

The Pleasant Way

"How come you're not eating your cake, Beautiful?"

"I have to watch my figure."

"You eat the cake. I'll watch your figure."

OWEN

Type "A" Work Benches
Finest in the Field!

Owen Type "A" Work Benches are all-steel, all-welded and mounted on rigid steel skids. Drawers are roller-mounted, with forward stops and a central locking mechanism. Guards prevent water and oil from draining in on tools. Sturdy stand provides convenient space for mounting vise. Six drawers for hand tools and instruments, a big bin for rags and steel pegs on the back apron for wrenches provide plenty of storage space.

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HOUSTON, TEXAS

Assistant Sales Managers Named By Jones & Laughlin Supply

H. L. Wilkins

A. G. Bastian

Jones & Laughlin Supply Company, Tulsa, has announced the appointment of H. L. Wilkins, Tulsa, and A. G. Bastian, Longview, as assistant sales managers.

Wilkins formerly was manager of branch stores, a position created to handle difficult operating problems in store management during the wartime period. Store operation and supervision are now being directed by sales personnel.

Bastian, who formerly was general salesman in the East Texas District, will continue to make his headquarters in Longview.

M. L. Eubank of Longview, formerly a salesman in the East Texas District, has been made district sales manager. W. O. Hardy, Tulsa city salesman, has been made sales manager for the Kansas City District succeeding C. E. Robertson, resigned. Hardy will be located in Wichita, Kansas.

Ladish Establishes Office at Atlanta, Appoints Manager

Ladish Co., Cudahy, Wis., has established a district office in Atlanta and the New Orleans office has been discontinued.

The office will be at 452 Spring Street, N. W., and will serve the southeastern territory. W. W. Bowie, formerly manager of the New Orleans office, has been appointed manager to direct sale of the line of Ladish Controlled Quality Seamless Welding Fittings. Ladish Forged Steel Fittings and Ladish Forged Steel Flanges in this territory.

Lufkin Foundry & Machine Company Opens Office in Oklahoma City

The Lufkin Foundry & Machine Company, Lufkin, Texas, is opening an office April 1 in the Commerce Exchange Building, Oklahoma City. Cooper Richards, former manager of the Kansas area with offices at Great Bend, will be in charge.

Cooper Richards

The new office will handle the sales and service of Lufkin equipment in the Oklahoma City and Kansas areas. In addition to the line of pumping units, Lufkin now builds the Lufkin Cooper-Bessemer pumping engines, truck and tractor winches, truck-trailers, speed increasers and speed reducers.

Linville E. Caraway, sales engineer, and J. D. Bradley, service engineer, will continue in the Great Bend office. Both have returned to Lufkin's employ after several years in the armed forces. Newell Lynch will be in charge of service in the Oklahoma City area.

Prices to Be Cut Before April 1 By International Harvester

International Harvester Company announced price reductions which it estimated will save the users of its products approximately $20 million a year and said its action was taken "because we believe there is nothing more important to this country than to lower the prices of the goods that people buy."

Harvester's price reductions will become effective before April 1.

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(Fig. D373)
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(Fig. D375)
Fig. D373 Fig D375
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Texoma Expands Facilities and Operations in Supply Field

Texoma Supply Company, operating as a proprietorship since its organization in October, 1937, has been incorporated under the laws of Colorado, according to Carl J. Hochenauer, president and founder of the company. The reorganization is a part of the company's plans for expanded facilities and operations to better serve the oil and gas industries.

Other officers of the corporation are Ray H. Smith, vice president, and Frederick T. Borgwald, secretary-treasurer, who with Hochenauer comprise the board of directors. Smith will also serve as general sales manager.

Hochenauer and associates have been serving the oil industry for 35 years, he having first engaged in the oil well supply business in the Mountain states in 1915.

The company recently moved into larger quarters in the Elliott Building at 120 East 9th Street, Tulsa.

Texasteel Names Distributor For Oklahoma-Kansas Section

Texasteel Manufacturing Company announced that exclusive distribution of its products in Oklahoma and Kansas will be handled by Texoma Supply Company. This line of products includes electric steel sucker rods, polish rods and other sub-surface production accessories.

Oil Well Supply Names Manager For South Louisiana, Mississippi

From elevator operator to district manager in 12 years is the record of J. R. Coburn of U. S. Steel's Oil Well Supply Company.

Coburn will become district manager of the South Louisiana-Mississippi District April 1, with headquarters at New Orleans.

He succeeds B. A. August, who has been appointed manager of the Southwest Texas District with headquarters at San Antonio, also effective April 1.

Coburn, a native of Dallas, went to work for "Oilwell" as an elevator operator in Dallas in 1935.

Two Executives Are Elected By W. C. Norris, Manufacturer

Edward C. Bolger was named chairman of the board and William L. Butler was elected executive vice president at the annual meeting of the stockholders of W. C. Norris, Manufacturer, Inc., Tulsa.

Bolger was for many years an executive with General Motors Corporation. He returned to civilian status in 1946 after four years in the Navy, where he held the rank of lieutenant commander. Butler has been with the firm since 1935 in various executive capacities. He is being advanced from the position of secretary-treasurer.

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